CE8701 ESTIMATION, COSTING AND VALUATION ENGINEERING

CIVIL ENGINEERING - 7TH SEMESTER

UNIT I QUANTITY ESTIMATION

TOPIC 1.1 PHILOSOPHY OF QUANTITY ESTIMATION - PURPOSE OF QUANTITY ESTIMATION - METHODS OF QUANTITY ESTIMATION - TYPES OF QUANTITY ESTIMATES - APPROXIMATE ESTIMATES - DETAILED ESTIMATE - ESTIMATION OF QUANTITIES FOR BUILDINGS

1. To make out an estimate for a work the following data are necessary-Drawing, Specification and _____
a) materials
b) rates
c) labours
d) transportation

Answer: b
Explanation: The rates per unit of various items of work, the rates of various materials to be used in the construction, and the wages of different category of labour, skilled or unskilled as mason, carpenter, mazdoor, bhishti etc. available for preparing estimate.

2. _____ is required for preliminary studies of various aspects of a work or project.
a) Supplementary Estimate
b) Plinth Area Estimate
c) Revised Estimate
d) Abstract Estimate

Answer: d
Explanation: to decide the financial position and policy for administrative sanction by the competent administrative authority. In case of commercial projects as irrigation projects as irrigation projects, residential building projects and similar projects which earn revenue income, the probable income may be worked out.

3. Approximate cost of a hostel building for 100 students @Rs.10000/- per student works out as Rs. 10 lakhs.
a) True
b) False

Answer: a
Explanation: Approx. cost of a bed hospital @ Rs.50000/- per bed comes to Rs.50 lakhs. Approx. cost of a barrack of 10 bays @10000/- per bay comes to Rs.1 lakh.

4. Per kilometre basis depending on the nature of road, for 10 km of a state highway approx. cost @ Rs. 50000/- per 1 km works out as Rs. 5 lakh.
a) True
b) False

Answer: b
Explanation: Per kilometre basis depending on the nature of road, for 10 km of a state highway approx. cost @ Rs. 500000/- per 1 km works out as Rs. 50 lakh.

5. The approx. cost of 10 km length of irrigation channel of 3 cu m per sec. capacity @ Rs.70000/- per km works out as Rs.7 lakh.
a) True
b) False

Answer: a
Explanation: For an irrigation project having a commanded area 2000 hectares, approx. cost @ Rs.1000/- per hectare comes to Rs.20 lakhs.

6. Approx. cost of a bridge of 3 spans of 50 m each span @Rs.30000/- per running m of span comes to 3*50*30000 = Rs. 45 lakhs.
a) True
b) False

Answer: a
Explanation: Per running metre of span depending on the roadway, nature and depth of foundation, type of structure, etc. For small culverts approx. cost may also be per number of culverts of different spans.

7. Approximate cost of sewerage project for a population of one Rs. 10/- head works out as Rs. 10 lakh.
a) True
b) False

Answer: b
Explanation: Approximate cost of sewerage project for a population of one Rs. 100/- head works out as Rs. 100 lakhs.

8. Cube rate estimate is less accurate as compared to the plinth area estimate as the height of the building is also compared.
a) False
b) True

Answer: b
Explanation: Cube rate estimate is most accurate as compared to the plinth area estimate as the height of the building is also compared.

9. For storeyed building plinth area estimate is not prepared for each storey separately.
a) True
b) False

Answer: b
Explanation: For storeyed building plinth area estimate is prepared for each storey separately.

10. _____ is prepared on the basis of plinth area of building, the rate being deducted from the cost of similar building having similar specification, heights and construction, in the locality.
a) Cube Rate Estimate
b) Supplementary Estimate
c) Maintenance Estimate
d) Plinth Area Estimate

Answer: d
Explanation: Plinth area estimate is calculated by finding the plinth area of the building and multiplying by the plinth area rate. The plinth area should be calculated for the covered area by taking external dimension of the building at the floor level.

11. _____ is the amount provided in the estimate and bill of quantities for some specialised work to be done by a specialised firm; whose details are not known at the time of preparing estimate.
a) Prime cost
b) Provisional sum
c) Capital cost
d) Building cost index

Answer: b
Explanation: The work like installation of refrigerating machine; installation of lift, air conditioning, etc., for which full information

and details may not be known at the time of preparing estimate and entering into contract and are require to be installed by a specialised firm, a sum.

12. In this method approx. total length of walls is found in running metre and this total length multiplied by the rate per running metre of wall gives a fairly accurate cost.
a) Annual repair
b) Item rate estimate
c) Approximate quantity method estimate
d) Cubical content estimate

Answer: c
Explanation: For this method the structure may be divided into two parts viz. Foundation including plinth and Superstructure.

13. _____ estimate is a detailed estimate and is prepared to maintain the structure or work in proper order and safe condition.
a) Supplementary and revised estimate
b) Maintenance estimate
c) Item rate estimate
d) Revised estimate

Answer: b
Explanation: For building; this includes white washing, colour washing, painting, minor repairs etc. For road works the A.R. estimate provides for patch repairing, renewals, repair of culverts, etc.

14. A large work or project may consists of several building or small works and each of these work is known as _____
a) sub-work
b) sub-project
c) sub-head
d) sub-construction

Answer: a
Explanation: Detailed estimate of each sub-work is prepared separately and accounts of expenditure are kept sub-work wise.

15. The term _____ is used to denote a procedure of costing or valuing an item of work on the basis of actual labourers and materials required.
a) prime cost
b) hour-work
c) day-work
d) sub-work

Answer: c
Explanation: Certain items of work which cannot be measured as- a design in the plaster work, front architectural finish of a building, work under water, etc. are valued and paid by 'day work'. In such cases the schedule of rates of materials and different classes of labourers likely to be engaged in th work should be included in the tender and in contract agreement.

TOPIC 1.2 BITUMINOUS AND CEMENT CONCRETE ROADS

1. The surface of the highway pavement should be designed to allow _____
a) High rolling resistance
b) Low rolling resistance
c) No rolling resistance
d) Very high rolling resistance

Answer: b
Explanation: The surface of highway pavement should be designed to allow no rolling resistance for safety purposes.

2. The soil becomes weak in _____
a) Summer
b) Winter
c) Rainy season
d) Spring season

Answer: c
Explanation: The soil becomes weak in rainy season due to the absorption of water in the soil.

3. The pavement layer is considered superior if it distributes load like a _____
a) Point load
b) Uniformly distributed load
c) Uniformly varying load
d) Triangular load

Answer: a
Explanation: The pavement layer is considered most superior if it distributes the load equally to all parts of pavement.

4. Which of the following pavement has greater life?
a) Bituminous pavements
b) Cement concrete pavements
c) Gravel roads
d) Earth roads

Answer: b
Explanation: The cement concrete roads have a greater life than remaining all pavements which may last even up to 100 years.

5. Which of the following requirement is given most importance in highway design?
a) Structural
b) Functional
c) Seasonal
d) Maintenance

Answer: a
Explanation: The structural design like highway speed, geometric design is given the most importance in design.

6. The surface of the pavement should be _____
a) Smooth
b) Rough
c) Sufficient enough to resist skid
d) Very rough

Answer: c
Explanation: The surface of the pavement should be sufficient enough to resist the skid of vehicles by using friction.

7. Rough and uneven roads increase _____
a) Vehicle cost
b) Petrol cost
c) Accident cost
d) Vehicle operation cost

Answer: d
Explanation: Roughness and uneven roads will increase the cost of vehicle operation and maintenance of vehicle cost.

8. The drainage layer is _____
a) Surface course
b) Sub base
c) Base
d) Sub grade

Answer: b
Explanation: The drainage layer is the sub base layer that is used to collect the water from pavement surfaces to send to ground water.

9. The maximum stress sustained by concrete pavements in kg/cm^2 is _____
a) 40
b) 45
c) 50
d) 55

Answer: b
Explanation: The concrete pavements are designed to sustain a stress of $45Kg/cm^2$ which is the maximum limit.

10. The ICPB type of pavement uses _____
a) Concrete paver blocks
b) Fly ash
c) GGBS
d) RMC

Answer: a
Explanation: The ICPB uses mostly interlocking concrete paver blocks for the construction of pavements.

11. The ICPB may be used in _____
a) Water logged areas
b) Parks
c) Footpaths
d) Highways

Answer: a
Explanation: The inter locking concrete paver blocks may be used in water logged areas to absorb the water and send it to the ground water.

12. The design life of flexible pavement is _____
a) 12
b) 10
c) 8
d) 15

Answer: d
Explanation: The design life of flexible pavement is considered as 15 years, it may last even further if properly maintained.

13. The design period of cement concrete road is taken as _____
a) 20
b) 25
c) 30
d) 35

Answer: c
Explanation: The design period of cement roads is usually taken as 30 years but they can even last longer if properly maintained and designed.

14. In India the flexible pavement is designed as per _____
a) MSA
b) KSA
c) CSA
d) FSA

Answer: a
Explanation: The flexible pavements are designed as per IRC 37 which uses MSA to specify the unit of the vehicles.

15. The maximum length of vehicle that can be used on Indian roads is _____
a) 11
b) 12
c) 13
d) 14

Answer: b
Explanation: The maximum length of a vehicle in India is restricted as per the rotary design of the highway which is maximum 12m.

TOPIC 1.3 SEPTIC TANK

1. Which of the following materials is not used in the construction of a septic tank?
a) Concrete
b) Rubber
c) Fibreglass
d) Plastic

Answer: b
Explanation: A septic tank is a watertight chamber made of brick-work, concrete, fiberglass, PVC or plastic, through which black water from the cistern or pour-flush toilets and grey water through a pipe from inside a building or an outside toilet flows for primary treatment.

2. Septic tank is a small scale treatment unit.
a) True
b) False

Answer: a
Explanation: The septic tank is the most common small-scale decentralized unit for grey water and black water from cistern or pour-flush toilets. It is basically a sedimentation tank.

3. The shape of the tank is circular.
a) True
b) False

Answer: b
Explanation: The shape of the septic tank can be rectangular or cylindrical. Septic tanks are used for wastewater with a high content of settleable solids, typically for effluent from domestic sources.

4. The heavy particles in the tank _____
a) Float
b) Sink into the bottom
c) Separated using magnetic methods
d) Flow along liquid

Answer: b
Explanation: Liquid flows through the top and heavy particles sink to the bottom, while scum floats to the top. Over time, the solids that settle to the bottom are degraded anaerobically.

5. The scum formed in the tank _____
a) Flows
b) Gets dissolved
c) Sink into the bottom
d) Floats on top

Answer: d
Explanation: The scum formed in the tanks floats over the top. Over time, the solids that settle to the bottom are degraded anaerobically.

6. Which of the following methods are not used for the dispersion of the effluent out of a septic tank?
a) Wetlands
b) Soak pit
c) Evapo-transpiration mound
d) Leach field

Answer: a
Explanation: By using a soak pit, Evapo-transpiration mound or leach field, the effluent of the septic tank must be dispersed or transported to another treatment technology via a solids-free sewer, simplified sewer or solids-free sewer.

7. During the disposal of the sludge, it must be _____
a) Liquefied
b) Dried
c) Burned
d) Fluidized

Answer: b
Explanation: The sludge can be dried in planted or unplanted drying beds, settling or thickening ponds. If the sludge is dried or composted, it can be applied in agriculture as a valuable nutrient.

8. What is the amount of water used per person per day for flushing?
a) 2-3 L
b) 3-10 L
c) 4-30 L
d) 5-40 L

Answer: d
Explanation: The amount of water used by a person per day for flushing is 5-40 L. When septic tanks are used for a primary treatment in DEWATS systems, they are generally followed by anaerobic filters.

9. The first chamber in a septic tank should be at least _____ of the total length.
a) 10 %
b) 20 %
c) 35 %
d) 50 %

Answer: d
Explanation: The first chamber should be at least 50% of the total length and when there are only two chambers, it should be two thirds of the total length. Most of the solids settle out in the first chamber.

10. Which of the following reasons is correct with respect to the need of providing baffle walls?
a) Mixing of scum and wastewater
b) Settling of heavy particles

c) Increase velocity of the liquid
d) Prevent scum and solids from escaping

Answer: d
Explanation: The baffle or the separation between the chambers is to prevent scum and solids from escaping with the effluent. A T-shaped outlet pipe, the lower arm of which divides 30 cm below water level, further reduces the scum and solids that are discharged.

11. What are the product gases of anaerobic digestion?
a) Carbon-dioxide and methane
b) Methane and oxygen
c) Oxygen and carbon-dioxide
d) Nitrogen and methane

Answer: a
Explanation: Over time, anaerobic bacteria and micro-organisms start to digest the settled sludge anaerobically, transforming it into CO_2 and CH_4 and some heat. Optimal physical treatment by sedimentation takes place when the flow is smooth and undisturbed.

12. What is the mixture of methane and carbon-dioxide of anaerobic digestion called?
a) Waste gases
b) Poisonous gas
c) Biogas
d) Carbo-methane

Answer: c
Explanation: The mixture of methane and carbon-dioxide of an anaerobic digestion is called biogas. Over time, anaerobic bacteria and micro-organisms start to digest the settled sludge anaerobically, transforming it into CO_2 and CH_4 and some heat.

TOPIC 1.4 SOAK PIT

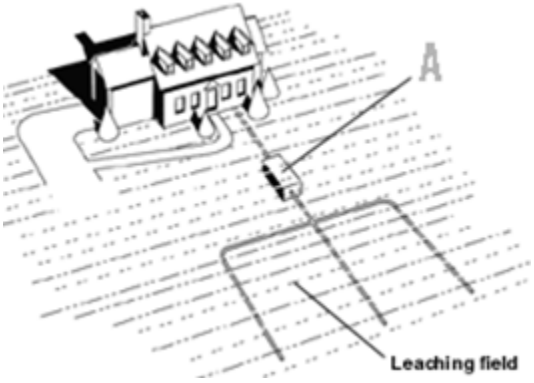
1. A _____ is a chamber made of concrete, fiberglass, PVC or plastic, through which domestic wastewater, sewage flows for primary treatment.
a) drainage tank
b) pit latrine tank
c) harvesting water tank
d) septic tank

Answer: d
Explanation: Septic tank systems are a type of onsite sewage facility (OSSF). They can be used in areas that are not connected to a sewerage system, such as rural areas. The treated liquid effluent is commonly disposed in a septic drain field which provides further treatment. However, groundwater pollution may occur and can be a problem.

2. The term "septic" refers to _____
a) anaerobic bacterial environment that develops in the tank
b) refers to safety and precaution
c) drainage of waste materials
d) aerobic bacterial environment that develops in the tank

Answer: a
Explanation: The term "septic" refers to the anaerobic bacterial environment that develops in the tank which decomposes or mineralizes the waste discharged into the tank. Septic tanks can be coupled with other onsite wastewater treatment units such as biofilters or aerobic systems involving artificially forced aeration.

3. Figure shown below represents a symbol 'A', it signifies?



a) Septic tank
b) Soak pit
c) Gutter
d) Water storing tank

Answer: a
Explanation: A septic tank collects and treats wastewater at a property that is not connected to the mains sewer system. Installed underground, a septic tank makes use of natural processes to treat the sewage it stores. Usually made up of two chambers or compartments, the tank receives wastewater from an inlet pipe. Wastewater enters the first chamber and separates over time, with solids settling at the bottom, oils and greases forming a layer of scum at the top, and a layer of relatively clear water remaining in the middle.

4. Septic tank is usually consists of brick wall in cement not less than _____
a) 20 cm
b) 100 cm
c) 80 cm
d) 200 cm

Answer: a
Explanation: Septic tank is usually consists of brick wall in cement not less than 20cm(9") thick and the foundation floor are of cement concrete 1:3:6 or 1:2:4. Both inside and outside faces of wall and floor are plastered with a minimum thickness of 12mm thick cement mortar 1:3 and all inside corners are rounded.

5. Connecting pipe should be _____ mm minimum diameter.
a) 60
b) 300
c) 700
d) 100

Answer: a
Explanation: It may be of R.C.C, Hume pipe, cast iron pipe, S.W. Inlet and outlet may be made through T-junction pipe or baffle wall of precast R.C.C. may be provided at a distance 1/5 of length of the septic tank so that the inlet sewage may not disturb the working of the tank.

6. Soak pit shall not be less than _____
a) 45 cm
b) 90 cm
c) 50 cm
d) 100 cm

Answer: b
Explanation: Soak pit shall not be less than 90 cm in diameter and not less than 1.5 m in depth below invert level of the inlet pipe. The pit is constructed with lining of dry brick or stone with open joints backed with at least 7.5 cm thick coarse aggregate.

7. A _____ is a type of toilet that collects human faeces in a hole in the ground.
a) gutter
b) septic tank
c) pit toilet
d) latrine

Answer: c
Explanation: A pit latrine or pit toilet is a type of toilet that collects human faeces in a hole in the ground. They use either no water or one to three litres per flush with pour-flush pit latrines. When properly built and maintained they can decrease the spread of disease by reducing the amount of human faeces in the environment from open defecation. This decreases the transfer of pathogens between faeces and food by flies.

8. The pit is typically at least _____ deep and _____ across.
a) 14 meters, 10 m
b) 30 meters, 15 m
c) 3 meters, 1 m
d) 11 meters, 9 m

Answer: c
Explanation: The World Health Organization

recommends they be built a reasonable distance from the house balancing issues of easy access versus that of smell. The distance from groundwater and surface water should be as large as possible to decrease the risk of groundwater pollution. The hole in the slab should not be larger than 25 cm (9.8 inches) to prevent children falling in. Light should be prevented from entering the pit to reduce access by flies. This may require the use of a lid to cover the hole in the floor when not in use.

9. The size of the faeces drop hole in the floor or slab should not be larger than _____

a) 5m
b) 25 cm
c) 45 cm
d) 250 mm

Answer: b
Explanation: The user positions themself over the small drop hole during use. The size of the feces drop hole in the floor or slab should not be larger than 25 centimeters (9.8 inches) to prevent children falling in. Light should be prevented from entering the pit to reduce access by flies. This requires the use of a lid to cover the hole in the floor when not in use. However, in practice, such a lid is not commonly used as it is easy to lose it or for the lid to get very filthy.

10. As of 2013 pit latrines are used by an estimated _____ people.
a) 1.77 billion
b) 2.77 million
c) 1.77 billion
d) 4.66 billion

Answer: c
Explanation: This is mostly in the developing world as well as in rural and wilderness areas. In 2011 about 2.5 billion people did not have access to a proper toilet and one billion resort to open defecation in their surroundings. Southern Asia and Sub-Saharan Africa have the poorest access to toilets. In developing countries the cost of a simple pit toilet is typically between 25 and 60 USD. Ongoing maintenance costs are between 1.5 and 4 USD per person per year which are often not taken into consideration.

11. As a very general guideline it is recommended that the bottom of the pit should be at least _____ above groundwater level.
a) 0.5 m
b) 2 m
c) 12 m
d) 20 m

Answer: b
Explanation: As a very general guideline it is recommended that the bottom of the pit should be at least 2 m above groundwater level, and a minimum horizontal distance of 30 m between a pit and a water source is normally recommended to limit exposure to microbial contamination.[1]However, no general statement should be made regarding the minimum lateral separation distances required to prevent contamination of a well from a pit latrine. For example, even 50 m lateral separation distance might not be sufficient in a strongly karstified system with a down gradient supply well or spring, while 10 m lateral separation distance is completely sufficient if there is a well developed clay cover layer and the annular space of the groundwater well is well sealed.

12. A _____ houses the squatting pan or toilet seat and provides privacy and protection from the weather for the user.
a) roof
b) terrace
c) shade
d) shelter

Answer: d
Explanation: A shelter, shed, small building or “super-structure” houses the squatting pan or toilet seat and provides privacy and

protection from the weather for the user. Ideally, the shelter or small building should have hand washing facilities available inside or on the outside (e.g. supplied with water from a rainwater harvesting tank on the roof of the shelter) although this is unfortunately rarely the case in practice. In the shelter, anal cleansing materials (e.g. toilet paper) and a solid waste bin should also be available. A more substantial structure may also be built, commonly known as an outhouse.

TOPIC 1.5 RETAINING WALLS

1. The theory of plasticity pertaining to soils is based on _____
a) Mohr's theory
b) Rankine's method
c) Mohr-coulomb theory
d) None of the mentioned

Answer: a
Explanation: The theory of plasticity pertaining to soils is based on Mohr's theory of rupture.

2. On designing retaining walls it is necessary to take care of _____ exerted by soil mass.
a) Erosion
b) Lateral pressure
c) Surcharge
d) Lateral stress

Answer: b
Explanation: In the designing of retaining walls; sheet piles or other earth-retaining structures, it is necessary to compute the lateral pressure exerted by the retained mass of soil.

3. The material retained or supported by the retaining structure is called _____
a) Surcharge
b) Support wall
c) Back fill
d) All of the mentioned

Answer: c
Explanation: The material retained or supported by the structure is called backfill which may have its top surface horizontal or inclined.

4. The coefficient of earth pressure when the soil is at equilibrium is _____
a) $\sigma v / \sigma h$
b) $\sigma h / \sigma v$
c) $\sigma v \times \sigma h$
d) $\sigma 1 / \sigma 3$

Answer: b
Explanation: When the soil is at elastic equilibrium(i.e. at rest) the ratio of horizontal to vertical stress is called the co-efficient of earth pressure of rest.
$\sigma h / \sigma v = K0$.

5. The computation of stress in plastic equilibrium is based on _____
a) Theory of plasticity
b) Mohr's theory of rupture
c) Rankine's theory
d) All of the mentioned

Answer: a
Explanation: The theory on which the computation of the stress in a state of plastic equilibrium is based is called the theory of plasticity.

6. The wedge-shaped portion of the backfill tending to move with the wall is called _____
a) Wedge fall
b) Active fall
c) Failure wedge
d) None of the mentioned

Answer: c
Explanation: During the active state, the wall moves away from backfill and a certain portion of the backfill in wedged-shaped tend to move which is called a failure wedge.

7. In active stress, the major principal stress σ1 acting on the wall will be in _____ plane.
a) Vertical
b) Horizontal
c) Inclined
d) Zero

Answer: b
Explanation: In an active state, the major principal stress σ1 is vertical and the minor principal stress σ3 is horizontal.

8. The plastic state of stress was proposed by _____
a) Mohr
b) Rankine
c) Coulomb
d) Darcy

Answer: b
Explanation: The plastic state of stress when the failure is imminent was investigated by Rankine in 1860.

9. The position of the backfill lying above the horizontal plane at the top of wall is called _____
a) Active state
b) Plasticity
c) Surcharge
d) Slip lines

Answer: c
Explanation: The position of the backfill lying above a horizontal plane at the elevation of the top of a wall is called the surcharge, and its inclination to the horizontal is called surcharge angle β.

10. What will be the co-efficient of passive earth pressure, at a depth of 8m in cohesion less soil sand with an angle of internal friction of 30° when the water rises to the ground level?
a) 4
b) 5
c) 3
d) 1

Answer: c
Explanation: Given φ = 30°
Co-efficient of passive earth pressure, Kp = (1 + sin φ) / (1 – sin φ)
Kp = (1 + sin 30)/ (1 – sin 30°)
KP = 3.

TOPIC 1.6 CULVERTS

1. A structure that allows water to flow under a road, railroad, trail, or similar obstruction from one side to the other side is called as _____
a) drainage
b) bridges
c) tunnel
d) culverts

Answer: d
Explanation: Culverts are commonly used both as cross-drains for ditch relief and to pass water under a road at natural drainage and stream crossings. A culvert may be a bridge-like structure designed to allow vehicle or pedestrian traffic to cross over the waterway while allowing adequate passage for the water.

2. A structure that carries water above land is known as an _____
a) aqueduct
b) aquedant
c) over surface
d) outland

Answer: a
Explanation: Bridges for conveying water, called aqueducts or water bridges are constructed to convey watercourses across gaps such as valleys or ravines. The term aqueduct may also be used to refer to the entire watercourse, as well as the bridge. Large navigable aqueducts are used as transport links for boats or ships.

3. If the span of crossing is greater than 12 feet (3.7 m), the structure is termed as bridge and otherwise is culvert.
a) True
b) False

Answer: a
Explanation: A bridge is a structure built to span physical obstacles without closing the way underneath such as a body of water, valley, or road, for the purpose of providing passage over the obstacle. There are many different designs that each serve a particular purpose and apply to different situations.

4. Culverts cannot be constructed of a variety of materials including cast-in-place or precast concrete.
a) True
b) False

Answer: b
Explanation: Culverts can be constructed of a variety of materials including cast-in-place or precast concrete (reinforced or non-reinforced), galvanized steel, aluminium, or plastic, typically high-density polyethylene. Two or more materials may be combined to form composite structures. For example, open-bottom corrugated steel structures are often built on concrete footings.

5. Construction or installation at a culvert site generally results in disturbance of the site soil.
a) True
b) False

Answer: a
Explanation: Construction or installation at a culvert site generally results in disturbance of the site soil, stream banks, or streambed, and can result in the occurrence of unwanted problems such as scour holes or slumping of banks adjacent to the culvert structure.

6. Box culverts can be defined as a passage for water over a natural ground having a deck slab over it as path way for vehicles.
a) True
b) False

Answer: b
Explanation: Slab culvert- A passage for water over a natural ground having a deck slab over it as path way for vehicles.
Box culvert – Box culverts are usually made up of Reinforced Concrete (RCC) as a box shaped tunnel through which the water flows and the vehicular transmission takes place over the box.

7. A culvert can be used to span over a canyon, or depression, or even over a freeway or roadway.
a) True
b) False

Answer: b
Explanation: A bridge doesn't necessarily have to bridge over water. A bridge can be used to span over a canyon, or depression, or even over a freeway or roadway.

8. The process of removing culverts, which is becoming increasingly prevalent, is known as _____
a) outlighting
b) culverting
c) daylighting
d) inlighting

Answer: c
Explanation: In urban design and urban planning, daylighting is the redirection of a stream into an above-ground channel. Typically, the goal is to restore a stream of water to a more natural state. Daylighting is intended to improve the riparian environment for a stream which had been previously diverted into a culvert, pipe, or a drainage system.

9. An _____ culvert is normally a low profile culvert. It allows them to be installed without disturbing the causeway as it will

span over the entire drainage width.
a) box
b) rectangle
c) arch
d) circular

Answer: c
Explanation: They are normally made of metal, stone masonry or RCC. They are installed easily, and you don't need to use expensive water diversion structures to install it. Common shapes include semicircular arch, elliptical arch, and concrete box culverts. Another benefit of these type of structure is that the installation process will not take a lot of time, compared to traditional box culverts.

10. _____ culverts have a concrete (sometimes other materials can be used too) floor allowing the water to flow smoothly through it.
a) Box
b) Cylindrical
c) Narrow
d) Long

Answer: a
Explanation: Box culverts are usually made up of Reinforced Concrete (RCC). Some box culverts can be built using composite structures and are great when water needs to change direction or when a large flow of water is expected. Box culverts can also be installed in such way that the top of the culvert is also the roadway surface. The most challenging part of installing these type of culverts is that you generally will need to have a dry surface to install the culvert, so dewatering or diversion of the water will be needed to complete the installation.

UNIT II RATE ANALYSIS AND COSTING

TOPIC 2.1 STANDARD DATA - OBSERVED DATA - SCHEDULE OF RATES - MARKET RATES

1. To make out an estimate for a work the following data are necessary-Drawing, Specification and _____
a) materials
b) rates
c) labours
d) transportation

Answer: b
Explanation: The rates per unit of various items of work, the rates of various materials to be used in the construction, and the wages of different category of labour, skilled or unskilled as mason, carpenter, mazdoor, bhishti etc. available for preparing estimate.

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b) Plinth Area Estimate
c) Revised Estimate
d) Abstract Estimate

Answer: d
Explanation: to decide the financial position and policy for administrative sanction by the competent administrative authority. In case of commercial projects as irrigation projects as irrigation projects, residential building projects and similar projects which earn revenue income, the probable income may be worked out.

3. Approximate cost of a hostel building for 100 students @Rs.10000/- per student works out as Rs. 10 lakhs.
a) True
b) False

Answer: a
Explanation: Approx. cost of a bed hospital @ Rs.50000/- per bed comes to Rs.50 lakhs.

Approx. cost of a barrack of 10 bays @10000/- per bay comes to Rs.1 lakh.

4. Per kilometre basis depending on the nature of road, for 10 km of a state highway approx. cost @ Rs. 50000/- per 1 km works out as Rs. 5 lakh.
a) True
b) False

Answer: b
Explanation: Per kilometre basis depending on the nature of road, for 10 km of a state highway approx. cost @ Rs. 500000/- per 1 km works out as Rs. 50 lakh.

5. The approx. cost of 10 km length of irrigation channel of 3 cu m per sec. capacity @ Rs.70000/- per km works out as Rs.7 lakh.
a) True
b) False

Answer: a
Explanation: For an irrigation project having a commanded area 2000 hectares, approx. cost @ Rs.1000/- per hectare comes to Rs.20 lakhs.

6. Approx. cost of a bridge of 3 spans of 50 m each span @Rs.30000/- per running m of span comes to 3*50*30000 = Rs. 45 lakhs.
a) True
b) False

Answer: a
Explanation: Per running metre of span depending on the roadway, nature and depth of foundation, type of structure, etc. For small culverts approx. cost may also be per number of culverts of different spans.

7. Approximate cost of sewerage project for a population of one Rs. 10/- head works out as Rs. 10 lakh.
a) True
b) False

Answer: b
Explanation: Approximate cost of sewerage project for a population of one Rs. 100/- head works out as Rs. 100 lakhs.

8. Cube rate estimate is less accurate as compared to the plinth area estimate as the height of the building is also compared.
a) False
b) True

Answer: b
Explanation: Cube rate estimate is most accurate as compared to the plinth area estimate as the height of the building is also compared.

9. For storeyed building plinth area estimate is not prepared for each storey separately.
a) True
b) False

Answer: b
Explanation: For storeyed building plinth area estimate is prepared for each storey separately.

10. _____ is prepared on the basis of plinth area of building, the rate being deducted from the cost of similar building having similar specification, heights and construction, in the locality.
a) Cube Rate Estimate
b) Supplementary Estimate
c) Maintenance Estimate
d) Plinth Area Estimate

Answer: d
Explanation: Plinth area estimate is calculated by finding the plinth area of the building and multiplying by the plinth area rate. The plinth area should be calculated for the covered area by taking external dimension of the building at the floor level.

11. _____ is the amount provided in the estimate and bill of quantities for some specialised work to be done by a

specialised firm; whose details are not known at the time of preparing estimate.
a) Prime cost
b) Provisional sum
c) Capital cost
d) Building cost index

Answer: b
Explanation: The work like installation of refrigerating machine; installation of lift, air conditioning, etc., for which full information and details may not be known at the time of preparing estimate and entering into contract and are require to be installed by a specialised firm, a sum.

12. In this method approx. total length of walls is found in running metre and this total length multiplied by the rate per running metre of wall gives a fairly accurate cost.
a) Annual repair
b) Item rate estimate
c) Approximate quantity method estimate
d) Cubical content estimate

Answer: c
Explanation: For this method the structure may be divided into two parts viz. Foundation including plinth and Superstructure.

13. _____ estimate is a detailed estimate and is prepared to maintain the structure or work in proper order and safe condition.
a) Supplementary and revised estimate
b) Maintenance estimate
c) Item rate estimate
d) Revised estimate

Answer: b
Explanation: For building; this includes white washing, colour washing, painting, minor repairs etc. For road works the A.R. estimate provides for patch repairing, renewals, repair of culverts, etc.

14. A large work or project may consists of several building or small works and each of these work is known as _____
a) sub-work
b) sub-project
c) sub-head
d) sub-construction

Answer: a
Explanation: Detailed estimate of each sub-work is prepared separately and accounts of expenditure are kept sub-work wise.

15. The term _____ is used to denote a procedure of costing or valuing an item of work on the basis of actual labourers and materials required.
a) prime cost
b) hour-work
c) day-work
d) sub-work

Answer: c
Explanation: Certain items of work which cannot be measured as- a design in the plaster work, front architectural finish of a building, work under water, etc. are valued and paid by ‘day work’. In such cases the schedule of rates of materials and different classes of labourers likely to be engaged in th work should be included in the tender and in contract agreement.

TOPIC 2.2 STANDARD DATA FOR MAN HOURS AND MACHINERIES FOR COMMON CIVIL WORKS

1. _____ is a self propelled machine which is used mainly to exert a powerful tractive force for pulling other machines.
a) Tractor
b) Bulldozer
c) Angle dozer
d) Scraper

Answer: a
Explanation: When the tractor is not required for hauling other machines, it can be easily converted to serve as bulldozer, angle dozer, etc. The tractor are used for agriculture operations.

2. A _____ is very useful equipment and it can be used for construction work like to clear the site of work, to make the land level, etc.
a) Scraper
b) Grader
c) Excavator
d) Bulldozer

Answer: d
Explanation: Depending upon the mountains, bulldozer maybe crawler tractor mounted bulldozer or will tractor mounted bulldozer. The latter can attain higher travel speed on the job and can be moved on paved floor without causing damage to the floor.

3. The size of the bulldozer is indicated by the dimension of its _____
a) Site
b) Tyre
c) Engine
d) Blades

Answer: d
Explanation: Each Blade has a theoretical capacity of hauling a particular type of earth and knowing the number of turns a bulldozer will make in a given time, the approximate output of a bulldozer can be activated.

4. A _____ can be used on wet ground and in all conditions of weather.
a) Grader
b) Scraper
c) Escalator
d) Bulldozer

Answer: d
Explanation: By suitable attachments to the bulldozer, it can be utilized to remove trees, rocks, Boulder, etc. In order to increase the output, two Bulldozers working side by side with their blades in contact can be used.

5. A _____ is used to level the ground and spreads the loose material.
a) Excavator
b) Scraper
c) Grader
d) Tractor

Answer: c
Explanation: Grader is a self propelled at home by a tractor. It consists of 3 to 4 M long angled blade supported on a Framework mounted on wheels. It performs various operations like grading, spreading, side cutting and mixing of materials.

6. A Grader which is told by a tractor is known as _____
a) Tractor grader
b) Motor grader
c) Scraper
d) Elevating grader

Answer: d
Explanation: The self propelled greater is known as a motor grader. For grading the machine moves forward and steering in controlling by Steering wheel.

7. _____ consists of a large bucket which is attached to a tractor.
a) Bulldozer
b) Scraper
c) Grader
d) Escalator

Answer: b
Explanation: The capacity of scrapper varies from 3 M cube to 9 M cube. The scrap as a cutting edge or blade and the bottom and it is possible to dig earth to a depth of about 250 mm.

8. _____ are usually mounted on two or four pneumatic tyred wheels.

a) Scraper
b) Backactor
c) Elevator
d) Escalator

Answer: a
Explanation: An apron is provided in front of the container which opens and close in order to regulate the flow of earth in and out of the container. Scrapers are capable of producing a very smooth and accurate formation level.

9. _____ type of scraper consists of a four wheeled scrapper bowl towed behind crawler Power unit.
a) Three axle
b) Two axle
c) Crawler drawn
d) Four axle

Answer: c
Explanation: Capacities of a scrapper bowl ranges from 3 metre cube to 50 metre cube. The speed of operation is governed by the speed of towing vehicles, which is 8 km per hour when hauling, and 3 km per hour, when scrapping.

10. An _____ is an oldest type of machine which removes earth.
a) Escalator
b) Excavator
c) Elevator
d) Bulldozer

Answer: b
Explanation: Excavator performs it work of moving the earth while the main unit is stationary. The title effort is required to move the dead weight of earth in a vertical plane.

11. _____ type of excavator used for digging the foundation trenches below operating level.
a) Clamshell
b) Backactor
c) Power shovel
d) Skimmer

Answer: b
Explanation: Back trench hoe excavator can also be used for the excavation of smaller areas such as basement, footing and trenches. The hoe is an instrument for scrapping, digging and losing the earth.

12. _____ type of excavator is used for digging below, at or above operating level in a vertical range.
a) Skimmer
b) Dragline
c) Clamshell
d) Back trench

Answer: c
Explanation: The Clamshell excavator are widely used for rehandling of material and for working in Limited space as in case of foundation trenches for pipelines, etc. It is also used for jobs that require fairly accurate dumping and disposal of material.

13. _____ type of excavator carries Shovel at its lower end.
a) Power shovel
b) Dragline
c) Clamshell
d) Backactor

Answer: a
Explanation: Power shovel excavator is used to dig at or above the operating level. It can handle loose rock and the material caught in the shovel can be suitably disposed off.

14. _____ type of excavator is used for digging at or below the operating level.
a) Skimmer
b) Dragline
c) Power shovel
d) Dredger

Answer: b
Explanation: The various types of dragline excavator are available and the factor affecting the output of a dragline excavator

are- the size and type of bucket, the depth of cutting, length of boom and the angle of Swing.

15. _____ type of excavator carries the skimmer at its lower end.
a) Skimmer
b) Dredger
c) Escalator
d) Elevator

Answer: a
Explanation: Skimmer is used for surface excavation and levelling and it cuts the surface of earth to a depth of about 200 mm to 300 mm. The skimmer excavator can also be used for loading the loose excavated material.

TOPIC 2.3 RATE ANALYSIS FOR ALL BUILDING WORKS, CANALS, AND ROADS

1. Which of the following is not a classification of labour?
a) Skilled first class
b) Skilled second class
c) Unskilled
d) Unskilled fourth class

Answer: d
Explanation: Labour is classified into skilled first-class, skilled second class and unskilled. The purpose of analysis of rates is for working out the economical use of materials and the actual cost of per unit of the items.

2. The concrete used for cement concrete roads is of grade _____
a) M 10
b) M 15
c) M 20
d) M 35

Answer: b
Explanation: The concrete used for cement concrete roads is of grade M 15 using 20 mm hand broken grade metal. For base course, concrete of 1:4:8 is used using 40 mm HBG metal.

3. Which of the following is the correct order of stages of estimation of concrete roads?
a) Earthwork excavations, cement concrete for the base course (1:4:8) and cement concrete for wearing course (1:2:8)
b) Earthwork excavations, cement concrete for wearing course (1:4:8) and cement concrete for the base course (1:2:8)
c) Earthwork excavations, cement concrete for the base course (1:6:9) and cement concrete for wearing course (1:7:9)
d) Cement concrete for the base course (1:2:3), cement concrete for wearing course (2:7:9) and earthwork excavations

Answer: a
Explanation: The correct order of stages of estimation of concrete roads is earth work excavations, cement concrete for the base course (1:4:8) and cement concrete for wearing course (1:2:8). Cement concrete road is laid over an existing Water Bound Macadam road.

4. The rates of materials used for government works are approved by _____
a) Executive Board
b) SDO
c) Elective Board
d) Board of Chief Engineers

Answer: d
Explanation: The Board of Chief Engineers approves the rates of materials used for government works. However, every year, these are fixed by the Superintendent Engineer.

5. Calculate the number of cement bags required for 2500 kg of cement.
a) 50
b) 100
c) 500
d) 200

Answer: a
Explanation: The weight of one cement bag is 50 kg. Therefore, the number of cement bags required for 2500 kg of cement is 2500/50 i.e. 50 bags.

6. The quantity of sand required for RCC (1:2:4) for 15 cubic metres of work is _____
a) 4.76 m^3
b) 10.32 m^3
c) 8.43 m^3
d) 6.51 m^3

Answer: d
Explanation: Approximately 1.52 m^3 of dry concrete is required for 1 m^3 of wet concrete. The quantity of sand required for RCC (1:2:4) for 15 cubic metres of work is [2/(1+2+4)] x 1.52 x 15 m^3 i.e. 6.51 m^3.

7. The quantity of coarse aggregate required for RCC (1:3:6) for 20 cubic metres of work is _____
a) 18.24 m^3
b) 15.23 m^3
c) 24.87 m^3
d) 32.45 m^3

Answer: a
Explanation: The ratio 1:3:6 is for cement, sand and coarse aggregate. Therefore, the quantity of coarse aggregate required for RCC (1:3:6) for 20 cubic metres of work is [6/(1+3+6)] x 1.52 x 20 m^3 i.e. 18.24 m^3.

8. Calculate the number of cement bags required for RCC (1:2:4) for 15 m^3 of work.
a) 24.6
b) 38.9
c) 56.7
d) 93.8

Answer: d
Explanation: The quantity of cement required is [1/(1+2+4)] x 1.52 x 15 m^3 i.e. 3.257 m^3. SP weight of concrete is 1440 kg/m^3 and the weight of one cement bag is 50 kg. Therefore, the number of cement bags required for RCC (1:2:4) for 15 m^3 of work is 3.257 x 1440/50 = 93.8 bags.

9. The unit of payment of cement concrete in lintels is _____
a) Per sqm
b) Per cum
c) Quintal
d) Kilograms

Answer: b
Explanation: The unit of payment of cement concrete in lintels is per cum. The unit of payment of R.C.C. in the slab is also per cum. Here, per cum stands for per cubic metre.

TOPIC 2.4 COST ESTIMATES

1. Which of the following are parameters involved in computing the total cost of a software development project?
a) Hardware and software costs
b) Effort costs
c) Travel and training costs
d) All of the mentioned

Answer: d
Explanation: All these are accounted for in estimating a software development cost.

2. Which of the following costs is not part of the total effort cost?
a) Costs of networking and communications
b) Costs of providing heating and lighting office space
c) Costs of lunch time food
d) Costs of support staff

Answer: c
Explanation: This is a incurred by the employees.

3. What is related to the overall functionality of the delivered software?
a) Function-related metrics
b) Product-related metrics
c) Size-related metrics
d) None of the mentioned

Answer: a
Explanation: Productivity is expressed in terms of the amount of useful functionality produced in some given time. Function points and object points
are the best-known metrics of this type.

4. A _____ is developed using historical cost information that relates some software metric to the project cost.
a) Algorithmic cost modelling
b) Expert judgement
c) Estimation by analogy
d) Parkinson's Law

Answer: a
Explanation: The model uses a basic regression formula with parameters that are derived from historical project data and current as well as future project characteristics.

5. It is often difficult to estimate size at an early stage in a project when only a specification is available
a) True
b) False

Answer: a
Explanation: Function-point and object-point estimates are easier to produce than estimates of code size but are often still inaccurate.

6. Which technique is applicable when other projects in the same analogy application domain have been completed?
a) Algorithmic cost modelling
b) Expert judgement
c) Estimation by analogy
d) Parkinson's Law

Answer: c
Explanation: The cost of a new project is estimated by analogy with these completed projects.

7. Which model assumes that systems are created from reusable components, scripting or database programming?
a) An application-composition model
b) A post-architecture model
c) A reuse model
d) An early design model

Answer: a
Explanation: It is designed to make estimates of prototype development.

8. Which of the following states that work expands to fill the time available.
a) CASE tools
b) Pricing to win
c) Parkinson's Law
d) Expert judgement

Answer: c
Explanation: The cost is determined by available resources rather than by objective assessment. If the software has to be delivered in 12 months and 5 people are available, the effort required is estimated to be 60 person-months.

9. Which model is used during early stages of the system design after the requirements have been established?
a) An application-composition model
b) A post-architecture model
c) A reuse model
d) An early design model

Answer: d
Explanation: Estimates are based on function points, which are then converted to number of lines of source code. The formula follows the standard form discussed above with a simplified set of seven multipliers.

10. Which model is used to compute the effort required to integrate reusable components or program code that is automatically generated by design or program translation tools?
a) An application-composition model
b) A post-architecture model
c) A reuse model
d) An early design model

Answer: c
Explanation: None.

11. The COCOMO model takes into account different approaches to software development, reuse, etc.
a) True
b) False

Answer: b
Explanation: Its the COCOMO-2 model. COCOMO 2 incorporates a range of sub-models that produce increasingly detailed software estimates.

UNIT III SPECIFICATIONS, REPORTS AND TENDERS

TOPIC 3.1 SPECIFICATIONS - DETAILED AND GENERAL SPECIFICATIONS - CONSTRUCTIONS SOURCES

1. Specifications are of two types- General specification or brief specification and _____
a) Short specification
b) General specification
c) Detailed specification
d) Brief specification

Answer: c
Explanation: The detailed specification of an item of work specifies the qualities and quantities of materials, the proportion of mortar, workmanship, the method of preparation and the execution and the method of measurement. The detailed specification of different items of work are prepared separately and describe what the works should be and how they shall be executed and constructed.

2. For first class building D.P.C. shall be _____ thick cement concrete 1:1 1/2:3.
a) 10.5 cm
b) 2.5 cm
c) 5.5 cm
d) 0.5 cm

Answer: b
Explanation: D.P.C. shall be 2.5 cm (1") thick cement concrete 1:1 1/2:3, mixed with one kg of impermo per bag of cement or other standard water proofing materials as specified and painted with two coats of bitumen.

3. For First class building drawing room and dining room floors shall be of _____
a) Concrete
b) Tiles
c) Mosaic
d) Wooden

Answer: c
Explanation: Floors of bedrooms shall be coloured and polished of 2.5 cm(1") cement concrete over 7.5 cm(3") lime concrete. Floors of others shall be of 2.5 cm (1") cement concrete over 7.5 cm(3") lime concrete polished.

4. For first class building chaukhats shall be of seasoned _____
a) Sesame wood
b) Saal wood
c) Teak wood
d) Arjun wood

Answer: c
Explanation: Shutters shall be teak wood 4.3 cm thick panelled glazed or partly panelled and partly glazed as required, with additional wire gauge shutters. All fittings shall be of brass. Doors and windows shall be varnished or painted two coats with high class enamel paint over one coat of priming.

5. For fourth class building roofing shall be of _____ over bamboo and wooden supports.
a) Mud roof
b) Tile roof
c) Wooden roof
d) Bamboo roof

Answer: b
Explanation: Roof tiles are designed mainly to keep out rain, and are traditionally made from locally available materials such as terracotta or slate. Modern materials such as concrete and plastic are also used and some clay tiles have a waterproof glaze. Roof tiles are 'hung' from the framework of a roof by fixing them with nails.

6. For 2nd class building rain water pipes shall be of _____ finished painted.
a) Cast iron
b) Bog iron
c) Brown ore
d) Pyrite

Answer: a
Explanation: Cast iron is a group of iron-carbon alloys with a carbon content greater than 2%.[1] Its usefulness derives from its relatively low melting temperature. The alloy constituents affect its colour when fractured: white cast iron has carbide impurities which allow cracks to pass straight through, grey cast iron has graphite flakes which deflect a passing crack and initiate countless new cracks as the material breaks, and ductile cast iron has spherical graphite "nodules" which stop the crack from further progressing.

7. Foundation and plinth shall be of _____ brickwork with lime mortar over lime concrete.
a) 2nd class
b) 3rd class
c) 1st class
d) 4th class

Answer: c
Explanation: Characteristics of first class brick-
– All bricks should be of first class of standard specifications.
– Bricks should be made of good earth completely burnt.
– Bricks should be of deep cherry red or copper colour.
– Bricks should be regular in shape.
– Edges of bricks should be sharp.
– On being struck, bricks should emit clear ringing sound.
– Bricks should be free from cracks, chips, flaws and lumps of any kind.
– Bricks should not absorb water more than one sixth of its weight after one hour of immersing in water.

8. Specification does not specify or describes the nature and the class off the work, materials to be used in the work, workmanship, etc.
a) False
b) True

Answer: a
Explanation: Specification specifies or describes the nature and the class off the work, materials to be used in the work, workmanship, etc., and is very important for the execution of the work. The cost of a work depends much on the specifications.

9. The specifications are written in a language so that they indicate what the work should be and words "shall be" or "should be" are used.
a) True
b) False

Answer: a
Explanation: The General Specification for Civil Engineering Works lays down the quality of materials, the standards of workmanship, the testing methods and the acceptance criteria for civil engineering works undertaken for the government for a particular Region. Where necessary, this General Specification should be supplemented by a particular specification.

10. General specification gives the nature and the class of the work and the materials in general terms.
a) True
b) False

Answer: a
Explanation: It is a short description of different parts of the work specifying materials, proportion, qualities, etc. General specification give general idea of the whole work or structure and are useful for preparing the estimate.

11. For first class building the foundation and plinth shall be of 1st class brickwork in lime mortar or 1:2 cement mortar over lime concrete or 1:6:7 cement concrete.
a) True
b) False

Answer: b
Explanation: Foundation and plinth shall be of 1st class brickwork in lime mortar or 1:6 cement mortar over lime concrete or 1:4:8 cement concrete.

12. For first class building roof shall be of R.C.C. slab.
a) True
b) False

Answer: a
Explanation: Roof shall be of R.C.C. slab with an insulation layer and lime concrete terracing above, supported over R.S. Joists or R.C.C. beams as required. Height of rooms shall not be less than 3.7 m (12 feet).

13. For 2nd class building superstructure shall be of 1st class brickwork in lime mortar.
a) True
b) False

Answer: b
Explanation: For 2nd class building superstructure shall be of 2nd class brickwork in lime mortar. Lintels over doors and windows shall be of R.B.

14. For third class building flooring shall be of brick-on-edge floor over well rammed earth.
a) True
b) False

Answer: a
Explanation: Rammed earth is simple to manufacture, non-combustible, thermally massive, strong, and durable. However, structures such as walls can be laborious to construct of rammed earth without machinery, e. g., powered tampers, and they are susceptible to water damage if inadequately protected or maintained.

15. For fourth class building the doors and windows shall be of _____ wood or country wood.
a) Sal
b) Neem
c) Teak
d) Mango

Answer: d
Explanation: Technically mango is a hardwood with dense grains, so it has the strength to bear the weight necessary for chairs and heavy tables, but it's still soft enough that it's relatively easy to work with, requiring no special tools on behalf of the manufacturers. Mango furniture can stand the wear and tear of time as well as your grandmother's oak kitchen table, but, unlike

traditional hardwood furniture, it's more affordable and, as we'll get into, completely sustainable.

TOPIC 3.2 TYPES OF SPECIFICATIONS

1. The water proof mud- plaster consists of _____
a) soil
b) janta Emulsion
c) cowdung
d) soil, janta emulsion and cowdung

Answer: d
Explanation: Soil – soil should not be too much clayey nor too much sandy (50% clay and 50% sand are suitable). Weight of dry earth should do about 112 kg per cu m (70 lbs per cu ft).
Bhusa – About 60% of bhusa by weight of dry soil is to be mixed.
Cowdung – It should be used for surface finishing.
Janta Emulsion – 5% of janta emulsion by weight of dry soil is to be mixed.

2. The brick work is not measured in cu m in case of _____
a) one or more than one brick wall
b) brick work in arches
c) reinforced brick work
d) half brick wall

Answer: d
Explanation: Half brick wall is measured in sq m.

3. The excavation exceeding 1.5 m in width and 10 sq. m in plan area with a depth not exceeding 30 cm, is termed as _____
a) excavation
b) surface dressing
c) surface excavation
d) cutting

Answer: c
Explanation: Surface dressing is done upto 15 cm depth and surface excavation upto 30 cm depth.

4. Stabilized soil wall is cued for _____ to _____ days by sprinkling water.
a) 3 to 6
b) 15 to 20
c) 7 to 10
d) 20 to 35

Answer: c
Explanation: An appropriate type of chosen soil, when compacted at optimum moisture content, can be made strong and durable by the addition of a stabilizing agent. Stabilisation enables the soil to retain its shape and a significant proportion of its strength even when wetted to the point of saturation.

5. The roofing cannot be made with slate.
a) True
b) False

Answer: b
Explanation: Slate can be made into roofing slates, a type of roof shingle, or more specifically a type of roof tile, which are installed by a slater. Slate has two lines of breakability – cleavage and grain – which make it possible to split the stone into thin sheets. When broken, slate retains a natural appearance while remaining relatively flat and easy to stack.

6. Average number of blocks required for a two-roomed house is about 2500.
a) True
b) False

Answer: a
Explanation: More recently, an improved version has been designed and marketed by Aeroweld Industries, B-9 HAL Industrial Estate, Bangalore – 560 037. The size of the blocks is 30.5 cm x 14.4 cm x 10 cm or 23 cm

x 19 cm x I0 cm. One such machine can be utilised to make 300 – 500 blocks per day by four unskilled workmen.

7. Before applying water proof mud plaster, the joints should not be scrapped.
a) True
b) False

Answer: b
Explanation: Before applying water proof mud plaster, the joints should be scrapped and wall surface should be cleaned and made damp by sprinkling water and then plaster should e applied.

8. For preparation of subgrade the existing subgrade should be dressed to a camber of 1 in 24 to 1 in 32.
a) True
b) False

Answer: a
Explanation: It is watered and allowed to soak for the night if necessary, and rolled with 8 to 10 tonne road roller. The density of the compacted soil should not be less than 1.8 gm /c.c. up to at least 6" depth.

9. For making bund ordinary mud wall gonda (bund) about 8" * 6" shall be made on the sides.
a) True
b) False

Answer: a
Explanation: Bunding, also called a bund wall, is a constructed retaining wall around storage "where potentially polluting substances are handled, processed or stored, for the purposes of containing any unintended escape of material from that area until such time as remedial action can be taken.

TOPIC 3.3 PRINCIPLES FOR REPORT PREPARATION

1. A written report is more formal than an oral report.
a) True
b) False

Answer: a
Explanation: The statement is true. A written report is more formal in nature than an oral report and it removes almost every flaw inherent in an oral report.

2. Which of these is usually written in a form of a memorandum?
a) Informal reports
b) Formal reports
c) Professional reports
d) Business reports

Answer: a
Explanation: Written reports can be of two types. They are: formal reports and informal reports. Informal reports are normally written in the form of a memorandum or a letter.

3. Which of these is not a formal report?
a) Informational
b) Informal
c) Interpretative
d) Routine

Answer: b
Explanation: Formal reports can be classified into three different types. They are : informational, interpretative and routine.

4. Into which of these types are formal reports not classified?
a) Informational
b) Interpretative
c) Oral
d) Routine

Answer: c
Explanation: Formal reports are written reports. They can be classified into three types : informational, interpretative and routine.

5. Which of these reports provide information without any evaluation?
a) Informational
b) Interpretative
c) Routine
d) Progress

Answer: a
Explanation: Informational reports accumulate and provide information without any assessment or evaluation. They do not make any recommendations they do not give any findings.

6. _____ report provides rational findings.
a) Informative
b) Interpretative
c) Routine
d) Progress

Answer: b
Explanation: Interpretative reports do not merely provide data. They assess this data and provide rational findings and worthwhile recommendations.

7. Interpretative reports are also known as _____
a) recommendation reports
b) routine reports
c) progress reports
d) informal reports

Answer: a
Explanation: The correct statement is: Interpretative reports are also known as recommendation reports. They assess the data and provide rational findings and worthwhile recommendations.

8. Which of these reports are written for recording information?
a) Informational
b) Interpretative
c) Routine
d) Recommendation

Answer: c
Explanation: Routine reports are normally written for recording information which is required at periodic intervals. In most cases there may be printed forms where relevant gaps have to be filled with acquired data.

9. Which of these is not mentioned in a progress report?
a) Name of project
b) Right choice of instruments
c) Nature of work
d) Amount of work left

Answer: b
Explanation: A progress report should contain information like: Name of project, nature of project, extent of work to be completed, amount of work left, etc..

10. Which of these reports involves the checking of a piece of equipment to see if it's still in working condition?
a) Progress report
b) Laboratory report
c) Inspection report
d) Inventory report

Answer: c
Explanation: An inspection report is made when: An equipment is inspected to establish whether or not it is in working condition.

TOPIC 3.4 REPORT ON ESTIMATE OF RESIDENTIAL BUILDING - CULVERT, ROADS

1. A structure that allows water to flow under a road, railroad, trail, or similar obstruction from one side to the other side is called as _____
a) drainage
b) bridges
c) tunnel
d) culverts

Answer: d
Explanation: Culverts are commonly used both as cross-drains for ditch relief and to pass water under a road at natural drainage and stream crossings. A culvert may be a bridge-like structure designed to allow vehicle or pedestrian traffic to cross over the waterway while allowing adequate passage for the water.

2. A structure that carries water above land is known as an _____
a) aqueduct
b) aquedant
c) over surface
d) outland

Answer: a
Explanation: Bridges for conveying water, called aqueducts or water bridges are constructed to convey watercourses across gaps such as valleys or ravines. The term aqueduct may also be used to refer to the entire watercourse, as well as the bridge. Large navigable aqueducts are used as transport links for boats or ships.

3. If the span of crossing is greater than 12 feet (3.7 m), the structure is termed as bridge and otherwise is culvert.
a) True
b) False

Answer: a
Explanation: A bridge is a structure built to span physical obstacles without closing the way underneath such as a body of water, valley, or road, for the purpose of providing passage over the obstacle. There are many different designs that each serve a particular purpose and apply to different situations.

4. Culverts cannot be constructed of a variety of materials including cast-in-place or precast concrete.
a) True
b) False

Answer: b
Explanation: Culverts can be constructed of a variety of materials including cast-in-place or precast concrete (reinforced or non-reinforced), galvanized steel, aluminium, or plastic, typically high-density polyethylene. Two or more materials may be combined to form composite structures. For example, open-bottom corrugated steel structures are often built on concrete footings.

5. Construction or installation at a culvert site generally results in disturbance of the site soil.
a) True
b) False

Answer: a
Explanation: Construction or installation at a culvert site generally results in disturbance of the site soil, stream banks, or streambed, and can result in the occurrence of unwanted problems such as scour holes or slumping of banks adjacent to the culvert structure.

6. Box culverts can be defined as a passage for water over a natural ground having a deck slab over it as path way for vehicles.
a) True
b) False

Answer: b
Explanation: Slab culvert- A passage for water over a natural ground having a deck slab over it as path way for vehicles.
Box culvert – Box culverts are usually made up of Reinforced Concrete (RCC) as a box shaped tunnel through which the water flows and the vehicular transmission takes place over the box.

7. A culvert can be used to span over a canyon, or depression, or even over a freeway or roadway.
a) True
b) False

Answer: b
Explanation: A bridge doesn't necessarily have to bridge over water. A bridge can be used to span over a canyon, or depression, or even over a freeway or roadway.

8. The process of removing culverts, which is becoming increasingly prevalent, is known as _____
a) outlighting
b) culverting
c) daylighting
d) inlighting

Answer: c
Explanation: In urban design and urban planning, daylighting is the redirection of a stream into an above-ground channel. Typically, the goal is to restore a stream of water to a more natural state. Daylighting is intended to improve the riparian environment for a stream which had been previously diverted into a culvert, pipe, or a drainage system.

9. An _____ culvert is normally a low profile culvert. It allows them to be installed without disturbing the causeway as it will span over the entire drainage width.
a) box
b) rectangle
c) arch
d) circular

Answer: c
Explanation: They are normally made of metal, stone masonry or RCC. They are installed easily, and you don't need to use expensive water diversion structures to install it. Common shapes include semicircular arch, elliptical arch, and concrete box culverts. Another benefit of these type of structure is that the installation process will not take a lot of time, compared to traditional box culverts.

10. _____ culverts have a concrete (sometimes other materials can be used too) floor allowing the water to flow smoothly through it.
a) Box
b) Cylindrical
c) Narrow
d) Long

Answer: a
Explanation: Box culverts are usually made up of Reinforced Concrete (RCC). Some box culverts can be built using composite structures and are great when water needs to change direction or when a large flow of water is expected. Box culverts can also be installed in such way that the top of the culvert is also the roadway surface. The most challenging part of installing these type of culverts is that you generally will need to have a dry surface to install the culvert, so dewatering or diversion of the water will be needed to complete the installation.

TOPIC 3.5 TTT ACT 2000

1. Which of the following is not a type of cyber crime?
a) Data theft
b) Forgery
c) Damage to data and systems
d) Installing antivirus for protection

Answer: d
Explanation: Cyber crimes are one of the most threatening terms that is an evolving phase. It is said that major percentage of the World War III will be based on cyber-attacks by cyber armies of different countries.

2. Cyber-laws are incorporated for punishing all criminals only.
a) True
b) False

Answer: b
Explanation: Cyber-laws were incorporated in our law book not only to punish cyber criminals but to reduce cyber crimes and tie the hands of citizens from doing illicit digital

acts that harm or damage other's digital property or identity.

3. Cyber-crime can be categorized into _____ types.
a) 4
b) 3
c) 2
d) 6

Answer: c
Explanation: Cyber crime can be categorized into 2 types. These are peer-to-peer attack and computer as weapon. In peer-to-peer attack, attackers target the victim users; and in computer as weapon attack technique, computers are used by attackers for a mass attack such as illegal and banned photo leak, IPR violation, pornography, cyber terrorism etc.

4. Which of the following is not a type of peer-to-peer cyber-crime?
a) Phishing
b) Injecting Trojans to a target victim
c) MiTM
d) Credit card details leak in deep web

Answer: d
Explanation: Phishing, injecting Trojans and worms to individuals comes under peer-to-peer cyber crime. Whereas, leakage of credit card data of a large number of people in deep web comes under computer as weapon cyber-crime.

5. Which of the following is not an example of a computer as weapon cyber-crime?
a) Credit card fraudulent
b) Spying someone using keylogger
c) IPR Violation
d) Pornography

Answer: b
Explanation: DDoS (Distributed Denial of Service), IPR violation, pornography are mass attacks done using a computer. Spying someone using keylogger is an example of peer-to-peer attack.

6. Which of the following is not done by cyber criminals?
a) Unauthorized account access
b) Mass attack using Trojans as botnets
c) Email spoofing and spamming
d) Report vulnerability in any system

Answer: d
Explanation: Cyber-criminals are involved in activities like accessing online accounts in unauthorized manner; use Trojans to attack large systems, sending spoofed emails. But cyber-criminals do not report any bug is found in a system, rather they exploit the bug for their profit.

7. What is the name of the IT law that India is having in the Indian legislature?
a) India's Technology (IT) Act, 2000
b) India's Digital Information Technology (DIT) Act, 2000
c) India's Information Technology (IT) Act, 2000
d) The Technology Act, 2008

Answer: c
Explanation: The Indian legislature thought of adding a chapter that is dedicated to cyber law. This finally brought India's Information Technology (IT) Act, 2000 which deals with the different cyber-crimes and their associated laws.

8. In which year India's IT Act came into existence?
a) 2000
b) 2001
c) 2002
d) 2003

Answer: a
Explanation: On 17th Oct 2000, the Indian legislature thought of adding a chapter that is dedicated to cyber law, for which India's

Information Technology (IT) Act, 2000 came into existence.

9. What is the full form of ITA-2000?
a) Information Tech Act -2000
b) Indian Technology Act -2000
c) International Technology Act -2000
d) Information Technology Act -2000

Answer: d
Explanation: Information Technology Act -2000 (ITA-2000), came into existence on 17th Oct 2000, that is dedicated to cyber-crime and e-commerce law in India.

10. The Information Technology Act -2000 bill was passed by K. R. Narayanan.
a) True
b) False

Answer: b
Explanation: The bill was passed & signed by Dr. K. R. Narayanan on 9th May, in the year 2000. The bill got finalised by head officials along with the Minister of Information Technology, Dr. Pramod Mahajan.

11. Under which section of IT Act, stealing any digital asset or information is written a cyber-crime.
a) 65
b) 65-D
c) 67
d) 70

Answer: a
Explanation: When a cyber-criminal steals any computer documents, assets or any software's source code from any organization, individual, or from any other means then the cyber crime falls under section 65 of IT Act, 2000.

12. What is the punishment in India for stealing computer documents, assets or any software's source code from any organization, individual, or from any other means?
a) 6 months of imprisonment and a fine of Rs. 50,000
b) 1 year of imprisonment and a fine of Rs. 100,000
c) 2 years of imprisonment and a fine of Rs. 250,000
d) 3 years of imprisonment and a fine of Rs. 500,000

Answer: d
Explanation: The punishment in India for stealing computer documents, assets or any software's source code from any organization, individual, or from any other means is 3 years of imprisonment and a fine of Rs. 500,000.

13. What is the updated version of the IT Act, 2000?
a) IT Act, 2007
b) Advanced IT Act, 2007
c) IT Act, 2008
d) Advanced IT Act, 2008

Answer: c
Explanation: In the year 2008, the IT Act, 2000 was updated and came up with a much broader and precise law on different computer-related crimes and cyber offenses.

14. In which year the Indian IT Act, 2000 got updated?
a) 2006
b) 2008
c) 2010
d) 2012

Answer: b
Explanation: In the year 2008, the IT Act, 2000 was updated and came up with a much broader and precise law on different computer-related crimes and cyber offenses.

15. What type of cyber-crime, its laws and punishments does section 66 of the Indian IT Act holds?
a) Cracking or illegally hack into any system
b) Putting antivirus into the victim

c) Stealing data
d) Stealing hardware components

Answer: a
Explanation: Under section 66 of IT Act, 2000 which later came up with a much broader and precise law says that cracking or illegally hacking into any victim's computer is a crime. It covers a wide range of cyber-crimes under this section of the IT Act.

TOPIC 3.6 TENDER NOTICES - TYPES - TENDER PROCEDURES

TOPIC 3.7 DRAFTING MODEL TENDERS , E-TENDERING- DIGITAL SIGNATURE CERTIFICATES- ENCRYPTING - DECRYPTING

1. Quotations are letters of enquiry.
a) True
b) False

Answer: a
Explanation: The statement is true. Quotations are letters of enquiry in which an organisation or an individual asks another organisation or individual to quote its or his rates and terms of payment for the goods intended to be purchased.

2. Where is the name of the company inviting mentioned in an invitation of quotation?
a) Top left corner
b) Bottom left corner
c) Top right corner
d) Bottom right corner

Answer: c
Explanation: The name of the company inviting is mentioned in the top right corner on an invitation of quotation along with the address and date.

3. Where is the name of the company which is invited mentioned?
a) Top left corner
b) Top right corner
c) Bottom left corner
d) Bottom right corner

Answer: a
Explanation: The name of the company which is invited is mentioned in the top left corner in an invitation of quotation below the address of the inviting party.

4. Where is the courteous leave-taking mentioned in an invitation of quotation?
a) Top left
b) Bottom right
c) Top right
d) Bottom left

Answer: b
Explanation: The courteous leave-taking is mentioned in the bottom right corner along with signature and designation.

5. Quotations are friendly letters.
a) True
b) False

Answer: b
Explanation: The statement is false. Quotations are letters of enquiry and thus are business letters. It is normal to invite quotations from a large number of sellers.

6. A tender is advertised in _____
a) newspapers
b) business environment
c) domestic markets
d) sellers

Answer: a
Explanation: There is a difference between quotations and tenders. A tender is advertised in newspapers, magazines, etc..

7. Which of these is not mentioned in a tender?

a) Date
b) Notice number
c) Sign
d) Designation

Answer: c
Explanation: A tender does not have the sign of the authority mentioned in it. It only has the designation mentioned.

8. Where is the designation of the authority giving the tender mentioned?
a) Top center
b) Bottom left
c) Bottom right
d) Top left

Answer: c
Explanation: The name of the authority is mentioned in the bottom right corner along with the organization's name and branch.

9. Where is the name of the organization mentioned in the tender?
a) Top left
b) Top center
c) Top right
d) Bottom center

Answer: b
Explanation: The name of the organization along with tender notice number and date is mentioned in the top center in bold in the beginning.

10. Which of these is mentioned in a tender?
a) Notice number
b) Signature
c) Address of the tenderer
d) Courteous leave-taking

Answer: a
Explanation: In the top center, the name and address of the organisation is mentioned along with the tender notice number and the date.

TOPIC 3.8 REVERSE AUCTIONS.

1. In reverse engineering process, what refers to the sophistication of the design information that can be extracted from the source code?
a) interactivity
b) completeness
c) abstraction level
d) direction level

Answer: c
Explanation: None.

2. In reverse engineering, what refers to the level of detail that is provided at an abstraction level?
a) interactivity
b) completeness
c) abstraction level
d) directionality

Answer: b
Explanation: None.

3. The core of reverse engineering is an activity called
a) restructure code
b) directionality
c) extract abstractions
d) interactivity

Answer: c
Explanation: The engineer must evaluate the old program and extract a meaningful specification of the processing that is performed, the user interface that is applied, and the program data structures or database that is used.

4. What have become de rigueur for computer-based products and systems of every type?
a) GUIs
b) Candidate keys
c) Object model
d) All of the mentioned

Answer: a
Explanation: Therefore, the redevelopment of user interfaces has become one of the most common types of re-engineering activity. But before a user interface can be rebuilt, reverse engineering should occur.

5. Forward engineering is also known as
a) extract abstractions
b) renovation
c) reclamation
d) both renovation and reclamation

Answer: d
Explanation: Forward engineering, also called renovation or reclamation , not only recovers design information from existing software, but uses this information to alter or reconstitute the existing system in an effort to improve its overall quality.

6. Reverse engineering is the process of deriving the system design and specification from its
a) GUI
b) Database
c) Source code
d) All of the mentioned

Answer: c
Explanation: None

7. Reverse engineering techniques for internal program data focus on the definition of classes of objects.
a) True
b) False

Answer: a
Explanation: This is accomplished by examining the program code with the intent of grouping related program variables.

8. Which of the following steps may not be used to define the existing data model as a precursor to re-engineering a new database model:
a) Build an initial object model
b) Determine candidate keys
c) Refine the tentative classes
d) Discover user interfaces

Answer: d
Explanation: Once information defined in the preceding steps is known, a series of transformations can be applied to map the old database structure into a new database structure.

9. Much of the information necessary to create a behavioral model can be obtained by observing the external manifestation of the existing
a) candidate keys
b) interface
c) database structure
d) none of the mentioned

Answer: b
Explanation: The GUI or the interface provides the base for the behavioral model.

10. Extracting data items and objects, to get information on data flow, and to understand the existing data structures that have been implemented is sometimes called
a) data analysis
b) directionality
c) data extraction
d) client applications

Answer: a
Explanation: None.

11. Reverse engineering and Re-engineering are equivalent processes of software engineering.
a) True
b) False

Answer: b
Explanation: Re engineering is a process of analysis and change whereby a system is modified by first reverse engineering and then forward engineering.

12. Transformation of a system from one representational form to another is known as
a) Re-factoring
b) Restructuring
c) Forward engineering
d) Both Re-factoring and Restructuring

Answer: d
Explanation: None.

13. Which of the following is not an objective of reverse engineering?
a) to reduce maintenance effort
b) to cope with complexity
c) to avoid side effects
d) to assist migration to a CASE environment

Answer: d
Explanation: Reverse engineering helps us to detect side effects rather than avoiding them.

UNIT IV CONTRACTS

TOPIC 4.1 CONTRACT – TYPES OF CONTRACTS – FORMATION OF CONTRACT – CONTRACT CONDITIONS – CONTRACT FOR LABOUR, MATERIAL, DESIGN, CONSTRUCTION – DRAFTING OF CONTRACT DOCUMENTS BASED ON IBRD / MORTH STANDARD BIDDING DOCUMENTS – CONSTRUCTION CONTRACTS – CONTRACT PROBLEMS – ARBITRATION AND LEGAL REQUIREMENTS

1. A voluntary arrangement between two or more parties that is enforceable by law as a binding legal agreement is known as _____
a) job
b) loan
c) contract
d) mutual fund

Answer: c
Explanation: A contract arises when the parties agree that there is an agreement. Formation of a contract generally requires an offer, acceptance, consideration, and a mutual intent to be bound. Each party to a contract must have capacity to enter the agreement. Minors, intoxicated persons, and those under a mental affliction may have insufficient capacity to enter a contract. Some types of contracts may require formalities, such as a memorialization in writing.

2. What is the type of mistake which occurs when only one party to a contract is mistaken as to the terms or subject-matter?
a) Mutual mistake
b) Unilateral mistake
c) Bilateral mistake
d) Individual mistake

Answer: b
Explanation: The courts will uphold such a contract unless it was determined that the non-mistaken party was aware of the mistake and tried to take advantage of the mistake. It is also possible for a contract to be void if there was a mistake in the identity of the contracting party. An example is in Lewis v. Avery where Lord Denning MR held that the contract can only be voided if the plaintiff can show that, at the time of agreement, the plaintiff believed the other party's identity was of vital importance. A mere mistaken belief as to the credibility of the other party is not sufficient.

3. _____ contract is one that has automatic renewals until one party requests termination.
a) Uniform
b) Evergreen

c) Moderate
d) On-demand

Answer: b
Explanation: If these are left unattended, they can have significant cost impacts with little value. If these agreements won't work for the company, the clauses stating the contract automatically renews should be removed. If the clause makes sense or cannot be taken out, alerts can still be set in a contract management platform as a reminder.

4. How are final contracts signed in modern business?
a) e-Signatures
b) Document scanning
c) Thump impression
d) Shaking hands

Answer: a
Explanation: Electronic signatures, or e-Signatures, have become crucial for businesses as they seek to increase the speed of time-to-signature, e-Signatures are legally binding and have the same legal status as a written signature, as long as it fulfills the requirements of the regulation it was created under.
A contract management platform should include the ability to integrate with an e-Signature software, or include e-Signatures as part of the platform.

5. Which tender allows anyone to submit a tender to supply the goods or services that are required?
a) Framework tendering
b) Selective tendering
c) Open tendering
d) Close tendering

Answer: c
Explanation: On larger projects, there may then be a pre-qualification process that produces a short-list of suitable suppliers who will be invited to prepare tenders. This sort of pre-qualification process is not the same as selective tendering.
Open tendering has been criticised for attracting tenders / expressions of interest from large numbers of suppliers, some of whom may be entirely unsuitable for the contract and as a result it can waste a great deal of time, effort and money. However, open tendering offers the greatest competition and has the advantage of allowing new or emerging suppliers to try to secure work.

6. _____ involves the preparation of tenders based on a typical or notional bill of quantities or schedule of works.
a) Framework tendering
b) Selective tendering
c) Negotiated tendering
d) Serial tendering

Answer: d
Explanation: The rates submitted can then be used to value works over a series of similar projects, often for a fixed period of time following which the tendering procedure may be repeated. Serial tendering can reduce tender costs, and may encourage suppliers to submit low rates to secure an ongoing program of work.

7. _____ tendering is used when all the information necessary to calculate a realistic price is available when tendering commences.
a) Single-stage
b) Double-stage
c) Framework
d) Serial

Answer: a
Explanation: Single-stage tendering is the more traditional route, used when all the information necessary to calculate a realistic price is available when tendering commences:
• An invitation to tender is issued to prospective suppliers (perhaps following completion of a pre-qualification questionnaire and/or a pre-tender interview).

The invitation to tender will include information describing the goods or services required in sufficient detail to enable prospective suppliers to prepare an accurate tender.
• Tenders are prepared and returned by prospective suppliers (this may involve questions and answers and a mid-tender interview to clarify the client's requirements).
• Submitted tenders are then assessed and compared (this may involve further interviews).
• The preferred tenderer is selected and negotiations opened.
• Subject to the outcome of those negotiations the preferred tenderer may then be appointed.

8. An invitation to tender might not include?
a) Holiday packages
b) Preliminarie
c) A letter of invitation to tender
d) Design drawing

Answer: a
Explanation: An invitation to tender might be issued for a range of contracts, including; equipment supply, the main construction contract (perhaps including design by the contractor), demolition, enabling works and so on.
An invitation to tender might include:
• A letter of invitation to tender.
• The form of tender.
• Preliminaries.
• The form of contract.
• A tender pricing document.
• A drawing schedule.
• Design drawings.
• Specifications.

9. Mutual mistake occurs when both parties of a contract are mistaken as to the terms.
a) False
b) True

Answer: b
Explanation: Each believes they are contracting to something different. Courts usually try to uphold such mistakes if a reasonable interpretation of the terms can be found. However, a contract based on a mutual mistake in judgment does not cause the contract to be voidable by the party that is adversely affected.

10. In Schedule contract the contractor undertakes the execution or construction of specific work with all its contingencies, to complete it in all respect within a specified time for a fixed amount.
a) False
b) True

Answer: a
Explanation: In lump sum contract the contractor undertakes the execution or construction of specific work with all its contingencies, to complete it in all respect within a specified time for a fixed amount. In this an owner agrees to pay a contractor a specified lump sum after the completion of work without a cost breakdown. After work no detailed measurements are required.

UNIT V VALUATION

TOPIC 5.1 DEFINITIONS – VARIOUS TYPES OF VALUATIONS – VALUATION METHODS - NECESSITY – CAPITALISED VALUE – DEPRECIATION – ESCALATION – VALUATION OF LAND – BUILDINGS – CALCULATION OF STANDARD RENT – MORTGAGE – LEASE

1. _____ is the technique of estimating or determining the fair price or value of a property such as a building, a

factory, other engineering structures of various types.
a) depreciation
b) capital value
c) valuation
d) taxation

Answer: c
Explanation: By valuation the present value of a property is determined. The present value of property may be decided by its selling price, or income or rent it may fetch. The value of property depends on its structure, life, maintenance, location, bank interest, legal control, etc. The value also depends on supply on demand and the purpose for which valuation is required.

2. What is the capitalized value of a property fetching a net annual rent of Rs.1000 and the highest rate of interest prevalent being 5%, rate of interest is 8%?
a) Rs.16500.00
b) Rs.18500.00
c) Rs.12900.00
d) Rs.12500.00

Answer: d
Explanation: For Rs.5.00 interest, capital Rs.1000.00
To get Rs.1000.00 interest, capital = (100/5)*1000
= Rs.20000.00
In short capitalized value is – Net annual income*Year's purchase
For the same net income if the rate of interest is 8% the capitalized value = 1000*(100/8) = Rs.12500.00.

3. A pumping set with a motor has been installed in a building at a cost of Rs.2500.00. Assuming the life of the pump as 15 years, work out the amount of annual instalment of sinking fund required to be deposited to accumulate the whole amount of 4% compound interest.
a) Rs.355
b) Rs.125
c) Rs.185
d) Rs.1950

Answer: b
Explanation: The annual sinking fund, I = Si / [(1+i)n-1] = 2500*0.04/(1+0.04)15-1 = 2500*0.05 = Rs.125
The owner is to deposit Rs.125/- annually in 4% compound interest carrying investment for 15 years to accumulate Rs.2500/-.

4. An old building has been purchased by a person at a cost of Rs.30000/- excluding the cost of the land. Calculate the amount of annual sinking fund at 4% interest assuming the future lie of the building as 20 years and the scrap value of the building as 10% of the cost of purchase.
a) Rs.979.7
b) Rs.4387.20
c) Rs.107.20
d) Rs.907.20

Answer: d
Explanation: The total amount of sinking fund to be accumulated at the end of 20 years.
S = 30000 * 90/100 = Rs.27000.00
Annual instalment of sinking fund.
I = Si / [(1+i)n-1] = 27000*0.04/(1+0.04)20-1 = 27000*0.0336 = Rs.907.20
Annual Instalment for sinking fund required for 20 years = Rs.907.20.

5. In this method, it is assumed that the property will lose its value by a constant percentage of its value at the beginning of every year. This method is called?
a) Sinking fund method
b) Constant percentage method
c) Straight line method
d) Quantity survey method

Answer: c
Explanation: In this method a fixed amount of the original cost is deducted every year so that at the end of the utility period only the scrap value is left.
Annual depreciation D = Original cost-scrap

value/life in year = C-S/n,
Where C- original cost, S- scrap value, n-life of the property in years and D- annual depreciation. The book value after the number of years, say N years = original cost – N*D.

6. A property fetches a net annual income of Rs.900 deducting all outgoings. Workout the capitalized value of the property if the rate of interest is 6% per annum.
a) Rs.67003.00
b) Rs.189003.00
c) Rs.45603.00
d) Rs.15003.00

Answer: a
Explanation: Year's purchase = 100/6 = 16.67
Capitalized value of the property = Net income * Y.P. = 900*16.67 = Rs.15003.00.

7. A building costing Rs.700000.00 has been constructed on a freehold land measuring 100 sq m recently in a big city. Prevailing rate of land in the neighbourhood is Rs.150.00 per sq m. Determine the net rent of the property, if the expenditure on an outgoing including sinking fund is Rs.24000.00 per annum. Work out also the gross rent of the property per month.
a) 48000/-, 8000/-
b) 18000/-, 6000/-
c) 46700/-, 6000/-
d) 48000/-, 6000/-

Answer: d
Explanation: Cost of construction = Rs.700000.00
Cost of land @Rs.150.00 per sq m = 100*150 = Rs.150000.00
Net return:
On building @ 6% on the cost of construction = 700000.00 *6/100 = Rs.42000.00
On the land @ 4% on the cost of land = 700000.00 *6/100 = Rs.6000.00
Total net rent per year = Rs.48000.00
Gross rent = Net rent + outgoings = 48000+24000.00 = 72000.00 per annum
Gross rent per month = 72000/12 = 6000.00.

8. Find the plinth area required for the residential accommodation for an assistant engineer in the pay scale of Rs.400.00 to 1000.00 per month.
a) 293.33 sq m.
b) 93.33 sq m.
c) 983.33 sq m.
d) 23.33 sq m.

Answer: b
Explanation: Average pay = 400+1000/2 = Rs. 700.00 per month.
Average monthly rent @ 10% of salary = 700.00/10 = Rs.70.00
Average annual rent 70.0*12 = Rs.840.00.
Capital cost of the building @ 6%interest = 840*100/6 = Rs.14000.00
Plinth area required @Rs.150.00 per sq m of plinth area = 14000/150 = 93.33 sq m.
Normally the quarter for the assistant engineer should be constructed at the cost of Rs.14000.00 having plinth area of 93.33 sq m.
But due to the increase in the cost of construction, this may be increased by 100% and the capital cost of construction may be fixed as Rs.2800.00 and the approximate plinth area of 93.33.

9. Obsolescence is the annual periodic payments for repayments of the capital amount invested by a party.
a) True
b) False

Answer: b
Explanation: An annuity is a series of payments made at equal intervals. Examples of annuities are regular deposits to a savings account, monthly home mortgage payments, monthly insurance payments and pension payments. Annuities can be classified by the frequency of payment dates. The payments (deposits) may be made weekly, monthly, quarterly, yearly, or at any other regular

interval of time.
An annuity which provides for payments for the remainder of a person's lifetime is a life annuity.

10. Scrap value is the net annual letting value of a property, which is obtained after deducting the amount of yearly repairs from the gross income.
a) True
b) False

Answer: b
Explanation: In financial accounting, scrap value is associated with the depreciation of assets used in a business. In this situation, scrap value is defined as the expected or estimated value of the asset at the end of its useful life. Scrap value is also referred to as an asset's salvage value or residual value.