



PRACTICE QUESTIONS

for SSC-JE : CBT-2

Estimation & Costing and Utilization of Electrical Energy

Electrical Engineering



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Estimation & Costing and Utilization of Elect. Energy

- Q.1** The money to be invested and duration of time of completion of any project work can be determined is called
(a) Selling price (b) Estimating
(c) Selling time (d) Maintenance
- Q.2** The flexible conduit is used for making
(a) appliances
(b) connections
(c) electrical circuits
(d) parallel
- Q.3** A cable is wire with
(a) Insulation (b) Conduit
(c) flexible (d) Pilot
- Q.4** I.S.O. stands for _____
(a) Indian Standard Specifications
(b) International Standard organisation
(c) Indian Standard Institutions
(d) None of the above
- Q.5** The earthing protects against
(a) short circuit (b) electric shock
(c) circuit breaker (d) open circuit
- Q.6** The sudden expenses are called :
(a) Contingencies (b) Omissions
(c) Overhead (d) Production
- Q.7** Resistance welding cannot be used for
(a) non-ferrous metals
(b) ferrous metal
(c) steel
(d) dielectric
- Q.8** The resistance of human body is _____ than the earth wire.
(a) more (b) less
(c) low (d) high
- Q.9** Which type of motor is preferred for traction work?
(a) DC series motor
(b) 3- ϕ induction motor
(c) Universal motor
(d) Synchronous motor
- Q.10** The schematic diagram is drawn between - _____ parallel lines.
(a) Two (b) Three
(c) Four (d) None of the above
- Q.11** What type of earthing is used by transmission lines?
(a) Plate earthing
(b) Rod earthing
(c) Strip earthing
(d) Both Plate and Strip earthing
- Q.12** Candela is the unit of
(a) luminous intensity
(b) luminous flux
(c) wavelength
(d) frequency
- Q.13** Filament lamps operate normally at a power factor of
(a) Unity (b) 0.8 leading
(c) 0.5 lagging (d) 0.8 lagging
- Q.14** Which of the advantages of electric heating
(a) free from dirt
(b) absence of flue gases
(c) accurate temperature control
(d) all of the above

- Q.15** The purpose of coating the fluorescent tube inside with white powder
- (a) to increase light radiations due to secondary emissions
 - (b) to improve the vision
 - (c) to increase its life
 - (d) to have white colour
- Q.16** Suburban railways operates on
- (a) 400 V, 3 phases a.c.
 - (b) 1500 V d.c.
 - (c) 600 V, 3 phases a.c.
 - (d) 1100 V, 3 phases a.c.
- Q.17** Glare is reduced by
- (a) increasing lamp height
 - (b) using reflectors
 - (c) using diffusers
 - (d) all of the above
- Q.18** The centrifugal fans are used in :
- (a) air friction
 - (b) air coolers
 - (c) electrolytic
 - (d) axial
- Q.19** For heavy machinery _____ earthing is used.
- (a) Pipe or plate
 - (b) Metallic
 - (c) Current
 - (d) Lead tin
- Q.20** Each motor should have its own switch and _____ .
- (a) Power
 - (b) Starter
 - (c) TPIC
 - (d) Neutral
- Q.21** Average span of L.T. line is taken as _____
- (a) 60
 - (b) 80
 - (c) 30
 - (d) 50
- Q.22** The distance between two successive poles is known as
- (a) half
 - (b) span
 - (c) D-strap
 - (d) sundries
- Q.23** The electrode of a direct arc furnace is made of
- (a) copper
 - (b) silver
 - (c) tungsten
 - (d) graphite
- Q.24** Which motor is used for blowers?
- (a) DC compound motor
 - (b) DC shunt motor
 - (c) DC series motor
 - (d) Squirrel cage motor
- Q.25** A solid angle is expressed in term of
- (a) radians
 - (b) degrees
 - (c) radian/metre
 - (d) steradians
- Q.26** The colour of sodium vapour discharge lamp is
- (a) pink
 - (b) red
 - (c) bluish
 - (d) yellow
- Q.27** The function of choke in fluorescent tube
- (a) reduce the starting current
 - (b) reduce the flicker
 - (c) initiate the arc and stabilize it
 - (d) None of the above
- Q.28** The objective function to the optimisation problem in a hydrothermal system becomes
- A. minimise the fuel cost of thermal plants
 - B. minimise the time of operation
 - C. minimise the water availability of hydro-generation
- (a) Only A
 - (b) Only B
 - (c) Only C
 - (d) A, B and C
- Q.29** As per the recommendation of ISI the maximum load that can be connected in one subcircuit is
- (a) 800 Watts
 - (b) 1000 Watts
 - (c) 1600 Watts
 - (d) 500 Watts
- Q.30** Highly skilled labour is required in
- (a) TRS wiring
 - (b) conduit wiring
 - (c) casing capping wiring
 - (d) both conduit and casing capping wiring



Answer Keys

1. (b)	2. (b)	3. (a)	4. (b)	5. (b)	6. (a)	7. (d)
8. (a)	9. (a)	10. (a)	11. (c)	12. (a)	13. (a)	14. (d)
15. (a)	16. (b)	17. (d)	18. (b)	19. (a)	20. (b)	21. (d)
22. (b)	23. (d)	24. (d)	25. (d)	26. (d)	27. (c)	28. (d)
29. (a)	30. (b)					

Detailed Solutions

- (b)**

Estimating involves determining the amount of money to be invested and the duration of time required for the completion of a project. It includes forecasting costs, timelines, and resources needed for the project.
- (b)**

Flexible conduit is used to make connections in electrical systems. It provides protection and flexibility for electrical wiring, allowing for easy installation and movement while safeguarding the cables from physical damage.
- (a)**

A cable is essentially a collection of wires encased in insulation. The insulation provides protection to the wires, preventing electrical shorts, reducing the risk of electric shock, and ensuring that the cable can safely carry electrical currents.
- (b)**

Full form of I.S.O is International Standard organisation.
- (b)**

Earthing (or grounding) is a safety measure that protects against electric shock. It provides a safe path for electrical currents to flow into the ground in the event of a fault, thereby preventing potentially dangerous voltages from causing harm to people or damage to equipment.
- (a)**

Contingencies refer to sudden or unforeseen expenses that may arise during a project or operation. These are costs that are not anticipated but are set aside as a precautionary measure to handle unexpected situations.
- (d)**

Resistance welding is a process used primarily for welding ferrous metals, steel, and non-ferrous metals such as aluminum and copper. It involves passing a high electric current through the metal pieces to generate heat and create a weld. Dielectric materials, however, do not conduct electricity and are not suitable for resistance welding, which relies on electrical conductivity to generate heat.
- (a)**

The resistance of the human body is generally more than that of an earth wire. The earth wire is designed to have very low resistance to safely conduct fault currents to the ground, while the

human body has much higher resistance. This difference in resistance is crucial for ensuring that electrical faults are safely managed and minimizing the risk of electric shock.

9. (a)

DC series motors are preferred for traction work because they provide high starting torque and can handle variable loads efficiently. Their ability to produce high torque at low speeds makes them well-suited for applications like electric trains and trams, where such characteristics are essential for traction and acceleration.

10. (a)

A schematic diagram is typically drawn between two parallel lines. These parallel lines represent different electrical circuits or connections in the diagram. This layout helps in clearly distinguishing different circuit paths and components, making the schematic easy to read and understand.

11. (c)

Strip earthing is suitable for transmission lines.

12. (a)

Candela is the unit of luminous intensity, which measures the amount of light emitted by a source in a particular direction. It quantifies the power of light perceived by the human eye and is one of the seven base SI units.

13. (a)

Filament lamps, such as incandescent bulbs, operate at a power factor close to unity (or 1). This is because their resistance is primarily resistive with little to no reactance, resulting in a power factor of nearly 1. This means the voltage and current are in phase, and the power factor is effectively unity.

14. (d)

Electric heating has several advantages, including:

- Free from dirt: Electric heaters do not produce combustion by-products, so there is no accumulation of dirt or residue.
- Absence of flue gases: Since electric heaters do not rely on combustion, there are no flue gases or emissions, making them cleaner and safer.
- Accurate temperature control: Electric heating systems can provide precise temperature control, often through electronic thermostats and controls.

Therefore, all of these advantages are associated with electric heating.

15. (a)

The white powder coating inside a fluorescent tube, typically made of a phosphor material, serves to increase light radiations through secondary emissions. When the ultraviolet (UV) light produced by the fluorescent lamp strikes the phosphor coating, it causes the phosphor to emit visible light. This coating helps to convert UV radiation into visible light, improving the efficiency and brightness of the tube.

16. (b)

Suburban railways commonly operate on 1500 V DC (direct current). This voltage level is widely used for electrifying suburban railway lines due to its balance between efficiency and infrastructure costs. It allows for reliable and effective operation of trains in densely populated suburban areas.

17. (d)

Glare can be reduced through several methods:

- Increasing lamp height: Raising the height of the lamps can help to reduce direct glare by increasing the distance between the light source and the viewer.
- Using reflectors: Reflectors can help direct light in a way that minimizes direct exposure to the light source, thus reducing glare.
- Using diffusers: Diffusers spread the light more evenly and soften its intensity, which helps in reducing harsh glare.

All of these methods are effective in managing and reducing glare in various lighting situations.

18. (b)

Centrifugal fans are commonly used in air coolers and other ventilation systems. They are designed to move air efficiently through a system by using a rotating impeller to increase air pressure and direct it outwards, making them suitable for applications where air needs to be moved through ducts or over a large area.

19. (a)

For heavy machinery, pipe or plate earthing is commonly used. This type of earthing involves using metal pipes or plates buried in the ground to provide a reliable and low-resistance path for fault currents to safely dissipate into the earth. It is essential for ensuring safety and protecting both equipment and personnel from electrical faults.

20. (b)

Each motor should have its own switch and starter. A motor starter is a device used to start and stop the motor, and it typically includes protection features like overload protection and control circuitry. The starter helps in controlling the motor's start-up sequence, managing the electrical load, and providing safety against faults.

21. (d)

The average span of a Low Tension (L.T.) line is typically taken as 50 meters. This span length is commonly used in planning and designing overhead distribution lines to ensure structural integrity and proper electrical performance.

22. (b)

The distance between two successive poles in a power line or transmission line is known as the span. This term is used to describe the length of the overhead line segment supported between two poles or structures.

23. (d)

The electrodes of a direct arc furnace are typically made of graphite. Graphite is chosen because it has a high melting point, good electrical conductivity, and can withstand the intense heat generated

during the arc melting process. These properties make graphite an ideal material for use in electric arc furnaces, where it serves as a conduit for electrical current and helps generate the high temperatures required for melting metals.

24. (d)

Squirrel cage motors, which are a type of induction motor, are commonly used for blowers. These motors are preferred because of their robustness, reliability, and efficiency. They are well-suited for applications that require continuous operation and can handle varying loads, such as in blower systems.

25. (d)

A solid angle is measured in steradians. Steradians are the three-dimensional analog of radians and are used to describe the amount of space an angle subtends in three dimensions, similar to how radians describe angles in two dimensions.

26. (d)

Sodium vapour discharge lamps typically emit a yellow light. This is due to the sodium's emission spectrum, which predominantly produces a bright yellow color. These lamps are commonly used for street lighting and other applications where their distinct yellow light is beneficial.

27. (c)

The choke (or ballast) in a fluorescent tube serves several functions:

- Initiates the arc: It provides the necessary high voltage to ionize the gas and start the arc within the tube.
- Stabilizes the arc: Once the arc is established, the choke helps to regulate the current and maintain a stable operation of the fluorescent lamp.

By managing the current and voltage, the choke ensures that the fluorescent tube operates efficiently and reliably.

28. (d)

For hydrothermal generation the optimization problem is:

Minimise it the fuel cost of thermal plants under the constraints of water availability for hydrogeneration over a given period of time.

29. (a)

The number of points in light circuit should not exceed 10 or total load on circuit should not exceed 800 W.

30. (b)

Conduit wiring has a very long life and provide good mechanical protection. It is costlier and requires a highly skilled labour.

CTS wiring is economical and provide good protection from dampness.

Cleat wiring is very cheap but last short.





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