GGS COLLEGE OF MODERN TECHNOLOGY, KHARAR

DEPARTMENT OF

ELECTRICAL ENGINEERING

Question Bank

Energy Efficient Systems

Subject code – BTEE-604D-18

6th Semester B.Tech

SHORT ANSWER TYPE QUESTIONS:

1) **What are the loses in Transformers, Explain?** Ans.

(1) Iron loses (2) Copper loses

Iron Loss : Iron loss occurs in the transformers Iron core due to hysteresis and eddy currents taking place. They are almost fixed irrespective of loading of transformers.

Copper Losses: Copper losses are I2 R losses in the primary and the secondary windings of the transformer which with the loading of transformer.

2) Why a transformer requires cooling. What are the methods of cooling transformers?

Ans.Transformers requires cooling as they get heated up due to various losses taking place in the transformer. (like iron of copper losses)

Following are the methods of cooling of transformer.

a. Natural cooling by Air.
b. Oil Natural cooling Air natural (ONAN).
c. Forced oil air Natural Cooling (OFAN).
d. Forced oil and forced Air cooling (OFAF).

3) **What are the schedules of maintenance done on transformers**?

Ans. Following are the schedules of maintenance on transformers.

a. Daily maintenance.
b. Monthly maintenance.
c. Quarterly maintenance.
d. Half yearly maintenance.
e. Yearly maintenance.
f. 5 Yearly maintenance.

4) Explan different types of pumps used in Railways?

Ans: Following are the different types of pumps used in Railways.

a. Submersible pumps.
b. Mono block submersible pumps.
c. Centrifugal pumps.
d. Jet pumps.

5) Explain how double test lamp used for testing earth?

Ans: Double test lamp having three leads. Centre lead should be connected to earth, left side lead to be connected on positive side (+ve), right side to be connected on negative side (-ve) If both bulbs glow dimly it indicates no earth in the coach. If left side bulb glows brightly it indicates negative earth (-ve) in the coach. If right side bulb glows brightly it indicates positive earth (+ve) in the coach.

6) Explain the functioning of Submersible pumps?

Ans. Submersible pump by name it works in the water immersed condition. Generally, they are used in Bore-well. It consists of two parts, one motor and other pump. The motor is similar either asingle phase or three phase induction motor. It is specially designed as its armature is comparativelylonger and diameter is less impeller stages and made to work in water. The pump consists of impeller and guide wanes similar to a turbine generally for more delivery of water, number of stages are added to suit our requirement.

When supply is given the electric motor works. The water is sucked into impeller it gains kinetic energy and goes over stages. During this, it gains kinetic energy. By casing it converts as pressure energy. At the end, the water is delivered through delivery pipe.

7) What are the maintenance schedules of a pumping station and type of starters?

Ans. Following are maintenance schedule of the pumping installation:

Switch gear in every quarter and the motor & pump section every half yearly.Starters are DOL starter, star delta starter, Auto T/F starter.

8) What are the hydraulic data required for designing a pump capacity?

Ans: Following are the hydraulic data required for designing the pump capacity

a. The depth of the Bore or well (suction height/ below ground level)
b. The delivery light.
c. The yield of the Borewell.
d. The horizontal distance of the pumping from bore well where planned to deliver.

9) What is BHP, How do you calculate the BHP of pump BHP-> Brake horse power?

Ans The following formula is used for calculating the BHP capacity of the pump.

Q H/4500 = in horse power
i.e., P = Discharge in
Liters/minuteH= Head in
Meters

10) What do you mean by energy conservation? why it is required and how it can be done?

Ans Energy conservation means saving of Electricity without fore going its utility.

Conservation is required in present scenario of growing demand of power, depleting of natural resources and increase of and lack of Proportional, global worming

Conservation can be achieved by many methods some of the growing supply of power.

a. Use of star rated equipments like AC, methods geysers, Pumps, fans etc.
b. Provision CFL/.T5 in place of IC lamps.
c. By using non conventional sources of energy by reducing consumption of conventional sources of energy.
d. Switching OFF of lights/Fans when not required.
e. Use of solar water heater.
f. Use of solar plants.
g. Use of 70% & 30%.
h. Use of segregation timers for water wderse high mast lights pumps.
i. Use of APFC panels
j. Use of copper wiring inplace of Aluminum wiring.

11) What are the test and measuring instrument required in an Electrical depots?

Ans. Following are the test and measuring instruments required in an Electrical depots.

a. Test lamp
b. Line Tester
c. Continuity tester
d. Volt meter
e. Ammeter
f. Earth megger
g. Megger
h. Lux meter
i. Power analyzer
j. Infrared thermometer

12) What are the schedule maintenance to be carried out OH mains & UG Cables?

Ans. Following are the schedule to be maintained of HO mains and UG cables.

a. OH mains – Every Half yearly
b. UG.Cables – Every Yearly.

During those schedules, for OH, Guarding condition of insulators, sag in OH line are to be checked for UG cables, cables are to be beggared for their IR values.

13) What is CLS panel. Explain its importance?

Ans. CLS panel is the abbreviation of colour light signaling panel. It is the equipment whichsupplies uninterrupted power supply to signaling equipment by providing three power sources Supply, i.e UP AT, DN AT and local if power supply fails to signaling systems, it will result in detention of trains. Hence CLS panel is very important.

14) What is UPS how it works?

Ans. An UPS is a device which supply un interrupted power supply. This works on the principle of charging the batteries when normal power is available and take power during power is failed.

15) What is stabilizer?

Ans. Stabilizer is a device which supplies constant voltage irrespective of variation in the incoming power supply.

16) What is electricity?

Ans. It is a form of energy, which is invisible but can be felt by its effect.

17) What is Ohm's Law?

Ans. The electric current is directly proportional to electro motive force and inversely proportional to the resistance at constant temperature.

18) What is DC?

Ans. It is a unidirectional current which changes its magnitude but not the directions.

19) What is AC?

Ans. It is the current which changes its magnitude and direction periodically.

20) What is an earth?

Ans.Any wire of supply line touches the earth is called an earth.

21) What is fuse?

Ans. Fuse is used to protect an electric circuit when the rated current exceeds in the circuit the fuse wire melts and opens the circuit.

22) What is an alternator?

Ans. Alternator is a machine which converts mechanical energy into electrical energy

23) What is a motor?

Ans. Motor is a machine which converts electrical energy into mechanical energy.

24) What do you mean by turn?

Ans. Two conductors connected in series by end connection is called turn.

25) What do you mean by coil?

Ans. Having one or more turns connected in series is called coil.

26) Why starter is used in flourescent tube?

Ans. Starter is used in flourescent tube for automatic make & break in the circuit for starting purpose. It generates voltage in choke to aid in series with supply so as to stabilize gas discharge inFlourescent tubes.

27) Why the choke is used with tube light?

Ans. Choke is used as inductance and check voltage surge at starting and limit the current in Running.

28) What is a transformer?

Ans. Transformer is a static device which transforms power from one circuit to the other circuit. Step up Transformer is used to increase voltage from primary to secondary and Step downtransformer is used to reduce voltage from primary to secondary.

29) What do you mean by domestic air conditioner?

Ans. It is a closed self conducted cooling unit in a cabinet. It is modular in nature. It works on the principle of Thermodynamics second law and works on refrigeration cycle.

30) What is a battery?

Ans. Battery is a device which converts chemical energy into electrical energy. It stores energy in form of chemical energy. Types a) Primary cell batteries b) Secondary batteries.

31) What is the advantage of HRC fuses when compared with rewireable fuses?

Ans.HRC fuses have high rupturing capacity, high speed of operation and no aging effect.

32) What is meant by Power factor?

Ans. Power factor means ratio of true power to apparent power. It is cosine of phase angle between voltage and current. Its value is 1 for Unity P.F. Loads, 0 to 1 lagging for inductive loads and o to 1 leading for capacitive loads.

33) How can the state of charge of battery is best indicated?

Ans. The state of charge of battery is best indicated by specific gravity of electrolyte and voltage.

34) What is the purpose of Overload Protection in a motor circuit?

Ans. The Overload Protection is used in a motor circuit to protect it from sustained over currents.

35) Explain Briefing the half yearly schedule maintenance of OH mains?

Ans. "(a) Check all the jumper connections (b) Check any connections of the strands of the conductor (c) Check and ensure proper earth connection (d) Check proper fixation of insulators, stay wires, guard wires, etc. (e) Check proper tensioning and connection of service wires."

36) FAN – Trouble Shooting –

Ans **a.** Replacement of Regulator
b. Replacement of Capacitor.
c. Dismantle.
d. Erect a Fan
e. Cleaning.

37) Light – Trouble Shoot –

Ans **a.** Tube
a. Wire Cut
b. Switch
c. Erect
d. Dismantle

38) Wiring – types

Ans) a. Casing & Capping
b. Concealed wiring
c. Cleat Wiring
d. Conduit Wiring – Cutting of wall.

39) Identification of Safety Items in the Sub-Station & Why they are Used?

Ans. Horn gap fuse, circuit breakers, fire extinguishers, lightening arrestors, earth pits, handgloves, rubber mats, etc.
They are used for stopping of low and high voltages, to stop fire, to stop damages againstthunders, etc.

40) D.G. Set –

Ans.

- ON/OFF
- Daily Inspection about leakages, battery voltage, lub oil pressure, water temperature.
- Trouble Shooting about any faults.
- Reading Noting about parameters voltage, current, frequency, lub oil pressure.