A S-1

18/A/C/S-1/4/E

Booklet Series A

033/231, 035/233,
041/234, 070/232

PAPER-I
ELECTRICIAN / ELECTROPLATOR / LIFT MECHANIC / LIFT & ESCALATOR MECHANIC / WIREMAN
(THEORY & EMPLOYABILITY SKILLS)
SEMESTER – I

TIME : 3 Hrs. MARKS: 200

Note:- **This paper contains two parts – Part A & Part B.**
Attempt all the questions.
All questions carry equal marks.
This paper carries negative marking. 25% marks will be deducted for each wrong answer.

PART-A (Theory) (MARKS: 150)

Choose the correct answer:

1. The forbidden energy gap for germanium is –
a) 0.3 eV b) 3.5 eV c) 0.72 eV d) 1.1 eV

2. The bandgap of silicon at room temperature is –
a) 1.3 eV b) 0.7 eV c) 1.1 eV d) 1.4 eV

3. The earth wires are made of –
a) Copper b) Aluminium
c) Iron d) Galvanized stranded steel

4. The rating of fuse is always expressed in –
a) Volts b) Amperes c) Ampere-volts d) Ampere hours

5. A fuse is –
a) Always connected in series with the circuit
b) Always connected in parallel with the circuit
c) Normally connected in series with the circuit
d) Normally connected in parallel with the circuit

Contd....2

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6. The size of conductor used in power cables depends on –
   a) Operating voltage
   b) Power factor
   c) Current to be carried
   d) Type of insulation used

7. Ohm's law is applied to –
   a) Semiconductors b) Electrolytes c) Carbon resistors d) All of these

8. Two wires A and B of the same material and length L and 2L have radius R and 2R respectively. The ratio of their specific resistance will be –
   a) 1:1 b) 1:2 c) 1:4 d) 1:8

9. Ideal voltage sources have –
   a) Zero internal resistance
   b) Infinite internal resistance
   c) Low value of current
   d) Large value of emf

10. Kirchhoff's laws are valid for –
   a) Linear circuit only
   b) Passive time invariant circuits
   c) Nonlinear circuits only
   d) Both linear and nonlinear circuits

11. The unit of impedance is –
   a) Ohms b) Siemens c) Mho d) Henry

12. The value of peak factor of a sinusoidal waveform is –
   a) Zero b) 1 c) 1.11 d) 1.41

13. The algebraic sum of incoming current is equal to the sum of outgoing current is the statement of –
   a) Kirchoff's current law
   b) Kirchoff's voltage law
   c) Ohm's law
   d) Joule's law

14. A 12 V battery under fully charged condition has open circuit voltage of –
   a) 12 V b) < 12 V c) > 12 V d) ≤ 12 V

15. A 100W, 220 volt lamps takes a current of –
   a) 5/11 A b) 2.2 A c) 0.22 A d) 5/22 A

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16. The r.m.s. value of sinusoidal alternating current is given by the relation –
a) $I_m/2$ b) $0.637\ I_m$ c) $2I_m/\pi$ d) $I_m\sqrt{2}$

17. In a pure inductive A.C. circuit –
a) Voltage leads the current vector by 90^0 b) Voltage legs the current vector by 90^0
c) Current leads the voltage vector by 90^0 d) Current is in phase with the voltage vector

18. Primary battery is such a battery –
a) Which can be recharged
b) Which cannot be reconditioned by replacing chemical
c) Which cannot be reused
d) Which cannot be recharged

19. Internal resistance of a battery cell increases with –
a) Increases in concentration of electrolyte
b) Increase in distance between two electrodes
c) Increases in area of the plates inside the electrolyte
d) Increase in size of the electrodes

20. If cells are connected in series, then _____ will increase.
a) Current b) Voltage c) Power d) Energy

21. If Z is the electro – Chemical equivalent of a substance of the electrolyte. E is the chemical equivalent of the same substance, then the relation between Z & E will be –
a) $Z \propto E$ b) $Z = E$ c) $Z < E$ d) $Z > E$

22. Negative electrode or anode of simple voltaic cell is made of –
a) Copper b) Zinc c) Lead d) Carbon

23. E.C.E stands for –
a) Electrovalent chemical equivalent b) Electrolysis cathode equivalent
c) Electro chemical equivalent d) None of these

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24. Resistivity of metals is expressed in terms of –
a) $\mu\Omega$ b) $\mu\Omega$ - cm / ^{0}C c) $\mu\Omega$ - cm d) Ω

25. Permittivity of free space is equal to –
a) 8.84×10^{-12} F/m b) 8.84×10^{-13} F / m
c) 8.84×10^{-11} F / m d) 8.84×10^{-10} F / m

26. Which resistor will be physically larger in size?
a) 100 Ω, 10 W b) 10 Ω, 50 W c) 1 MΩ, 1/2 W d) 1 kΩ, 1 W

27. Two resistor are said to be connected in parallel when –
a) Same current passes in turn through both
b) Both carry the same value of current
c) Voltage across each resistance are same
d) Voltage across each resistance are not same

28. The electrical resistance of human body is around –
a) 5 ohms b) 25 ohms c) 250 ohms d) 1000 ohms

29. A 3 Ω resistor having 2A current will dissipate the power of –
a) 2 W b) 4 W c) 8 W d) 12 W

30. The filament of an electric bulb is made of –
a) Carbon b) Nickel c) Aluminium d) Tungsten

31. An current of 6 A is same as –
a) 6 Joule / Second b) 6 Coulomb / Second
c) 6 Watt / Second d) None of these

32. The equation of alternating current is i=42.4 sin 628 t. Then the average value of current is –
a) 42.42 A b) 27 A c) 38 A d) 22 A

Contd....5

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33. The rms value of a half wave rectified symmetrical square wave current of 2 A is given by -
a) 0.707 A b) 1 A c) 1.414 A d) 1.732 A

34. A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is –
a) 0.024 F b) 0.12 F c) 0.60 F d) 0.80 F

35. If the sheet of a backelite is inserted between the plates of an air capacitor, the capacitance will –
a) Decrease
b) Increase
c) Becomes zero
d) Remains unchanged

36. Three capacitors each of capacity C are given. The resultant capacity (2/3) C can obtained by using them –
a) All in series
b) All in parallel
c) Two in parallel and third in series with this combination
d) Two in series and third in parallel across this combination

37. The power dissipated in a pure capacitor is –
a) Zero
b) Proportional to applied voltage
c) Proportional to the value of capacitance
d) Both (b) & (c)

38. Three element having conductance G_1, G_2 and G_3 are connected in parallel. Their combined conductance will be –
a) $(G_1 + G_2 + G_3)^{-1}$
b) $G_1 + G_2 + G_3$
c) $1/G_1 + 1/G_2 + 1/G_3$
d) $(1/G_1 + 1/G_2 + 1/G_3)^{-1}$

39. Which of the following materials has highest electrical conductivity?
a) Steel b) Aluminium c) Copper d) Silver

40. If the phase angle between voltage and current of a 1-ϕ AC current is 60^0, then power factor is the circuit is –
a) 0.2 b) 0.5 c) 0.707 d) 1.0

Contd....6

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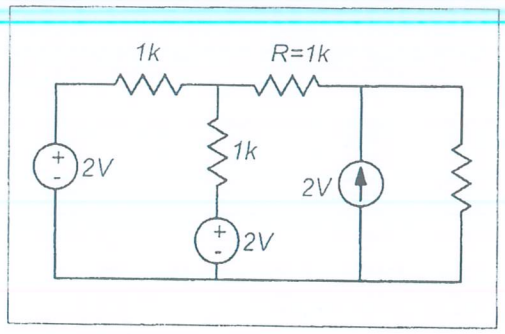
41. The current in the resistor R shown in Figure will be –
a) 0.2 A b) 0.4 A c) 0.6 A d) 0.8 A



42. Which of the following has positive temperature coefficient?
a) Germanium b) Gold c) Paper d) Rubber

43. Which law(s) find application in electrolysis?
a) Ohms' law b) Gauss's law c) Faradays' law d) Coulomb's law

44. Silver coating is provided for –
a) Protective purpose
b) Decorative purpose
c) Bearing surface
d) All of these

45. The permanent magnets are made from which of following materials?
a) Soft iron b) Ferromagnetic c) Paramagnetic d) Diamagnetic

46. The Biot-savart's law is a general modification of –
a) Kirchhoff's law b) Lenz's law c) Ampere's law d) Faradays' law

47. 1 Maxwell is the same as –
a) 10^{-8} weber b) 10^{8} weber c) 10^{4} weber d) 10^{-4} weber

Contd....7

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48. The direction of induced emf can be found by –
a) Laplace's law
b) Kirchhoff's voltage law
c) Lenz's law
d) Fleming's right hand rule

49. A closed switch has a resistance of -
a) Zero
b) About 50 ohms
c) About 500 ohms
d) Infinite

50. The energy stored in an inductor of inductor L Henry is represented as –
a) i^2L
b) iL^2
c) $(1/2)Li^2$
d) L^2/i

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