2022/TDC (CBCS)/EVEN/SEM/
PHSSEC-401T/117

TDC (CBCS) Even Semester Exam., 2022

PHYSICS

(4th Semester)

Course No. : PHSSEC-401T

(Electrical Circuits and Network)

Full Marks : 50
Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

SECTION—A

Answer any *fifteen* of the following questions : 1×15=15

1. Can you have voltage without current?

2. State the relation between current, resistance and voltage.

3. What is series and parallel combination?

4. Are solar panels AC or DC?

5. What are the elements of an electrical circuit?

6. Is there a voltage drop on DC?

7. What is node in circuit analysis?

8. Which component is used in the AC circuit to increase power factor?

9. State the purposes of understanding a schematic diagram.

10. What is the difference between AC and DC generator?

11. How is impedance related to capacitance?

12. What is the most common source of DC electricity?

13. How can you identify a motor is single-phase or three-phase?

14. What is the relation between the speed and the power of AC motor?

15. Why are diodes called rectifiers?

16. What happens when inductor and capacitor are connected in series?

17. What is the difference between wire and cable?

18. Give the full form of MCB.

19. Which instrument is used to measure power in AC circuit?

20. What is the standard cable used for almost all purposes?

SECTION—B

Answer any *five* of the following questions : 2×5=10

21. Why is DC not used in home?

22. How do you find power of a current?

23. How does a DC current flow in a circuit?

24. What are the basic laws for analysing an electric circuit?

25. What is the difference between a schematic and a writing diagram?

26. How do you read circuit boards and identify components?

27. Why is shunt connected in parallel?

28. How does an inductor respond to DC current?

29. How do star and delta connections work?

30. What are the different types of cable insulation?

SECTION—C

Answer any *five* of the following questions : 5×5=25

31. What is a multimeter used for? State the working principle of multimeter. How do you check voltage with a multimeter? 1+2+2=5

32. *(a)* State the difference between ammeter and galvanometer. 3

(b) Why is voltmeter connected in parallel in a circuit? 2

33. *(a)* Why does voltage drop across a resistor? 2

(b) State how power is derived in AC circuit. 3

34. Explain the terms 'power', 'power factor' and 'wattless current' in an AC circuit. When is the current entirely wattless? 3+2=5

35. How many types of DC power supply are there? Why is AC used over DC? 3+2=5

36. What are step-up and step-down transformers? Discuss the working principle of transformer. Describe the various losses occurring in a transformer. 1+2+2=5

37. What is the difference between fuse and relay? Are circuit breakers and relays the same? How does a circuit breaker relay work? 2+1+2=5

38. How can you use a junction diode as a rectifier? Draw circuit diagram of a full-wave rectifier. Which type of diode is used for full-wave rectifier? 2+2+1=5

39. What is voltage drop in cable? How do you calculate voltage drop across a cable? State how you can minimize voltage drop problems. 2+1+2=5

40. *(a)* What is electronic DMM? 2

(b) How do you measure voltage in a DC circuit? 3

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