

2BIN21011

(Pages : 2)

Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester BVOC AUTO Degree Examination, November 2021

SDC1AE01 – Basics of Electrical & Electronic Engineering

(2019 Admission onwards)

Time: 2 ½ hours

Max. Marks: 80

PART – A

Answer *all* questions.

Each question carries **Two** mark.

Ceiling -25 Marks

1. What do you mean by eddy current?
2. Ferromagnetic material is used as magnetic material in electrical equipment. Why?
3. What is the significance of residual magnetism in dc shunt generators?
4. What are the advantages of 3phase system?
5. For a 230V, 50 Hz sine wave, find out the instantaneous voltage at 1ms after the positive maximum value?
6. What is the significance of back emf in a dc motor?
7. Why is CE configuration the most extensively used?
8. Explain why an ordinary junction transistor is called bipolar?
9. What are the basic requirements of an oscillator?
10. Draw the symbolic diagram of an operational amplifier.
11. What is the application of an oscillator?
12. What do you mean by operating Point of transistor.
13. Draw the block diagrams for open and closed loop systems.
14. Draw the equivalent circuit of Op-Amp.
15. What is a communication channel?

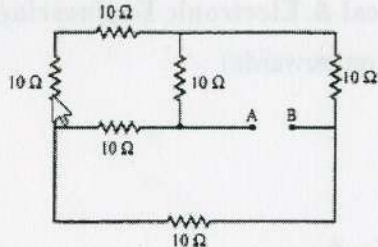
PART - B

Answer *all* questions.

Each question carries **Five** marks.

Ceiling -35 Marks

16. Calculate effective resistance between A and B?



17. A toroid coil has 1000 turns and diameter of 30 cm with the area of cross section of 2cm^2 . Calculate i) inductance of coil.

ii) Induced e.m.f when the current of 2 A is reversed in 0.03 secs.

18. Explain the working principle of a transformer?
19. A 25 KVA transformer has 500 turns in the primary and 50 turns in the secondary. Primary is connected to 3000 V, 50Hz supply. Find the primary and secondary currents. Also find secondary emf?
20. Explain the Q-point condition of a transistor?
21. When the Emitter current of a transistor is changed by 1 mA, its collector current changes by 0.995mA Calculate (a) Its CB current gain, α (b) Its CE current gain, β
22. Draw and explain Hartley oscillator circuit?
23. How can we avoid overlapping different channels?

PART - C

Answer any *two* questions.

Each question carries **Ten** marks.

24. Differentiate Ferromagnetic, paramagnetic and diamagnetic materials?
25. With diagram, explain the construction and theory of permanent magnet moving coil instrument.
26. Explain the requirements of biasing circuit of transistor and list out the different biasing circuits in detail.
27. Explain and compare different radio propagation methods?

2 x 10 = 20 Marks

2B1N21012

(Pages : 2)

Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester BVOC AUTO Degree Examination, November 2021

SDC1AE02 – Basic Mechanical Engineering

(2019 Admission onwards)

Time: 2 ½ hours

Max. Marks: 80

PART – A

Answer *all* questions.

Each question carries Two mark.

Ceiling -25 Marks

1. What is the zeroth law of thermodynamics?
2. Define Source and Sink.
3. Why we have multiple cylinders in an engine? Why not we can have one big cylinder of the same displacement of the eight cylinders instead?
4. What is Scavenging?
5. Explain the term CRDI.
6. Among Two-stroke Engine and Four-stroke Engine, which is generally preferred in automobile application and why?
7. What are the application of steam turbines?
8. Classify hydraulic turbines.
9. Which pump is a more efficient, centrifugal pump or reciprocating pump? Comment.
10. Explain Compressor.
11. Explain air conditioning.
12. What are the requirements of air conditioned space?
13. What is CNC machines?
14. Explain the advantages of Brazing and Soldering.
15. Compare spur and helical gears.

PART – B

Answer *all* questions.

Each question carries Five marks.

Ceiling -35 Marks

16. Efficiency of a Carnot engine with $T_1 = 200^\circ\text{C}$, $T_2 = 30^\circ\text{C}$, is ?
17. Compare heat pump and refrigerator.
18. What are the advantages of lubrication in IC engine?
19. Why do we not use same technology to start both SI/CI Engines?
20. Differentiate between the fan and blowers.
21. Write a short note on the impact of refrigerants on the environment.
22. Compare TIG and MIG.
23. Explain simple and compound gear train.

PART - C

Answer any *two* questions.

Each question carries Ten marks.

24. List out and explain the major components in an automobile with their functions.
25. Explain thermal power plants in detail.
26. Distinguish between window air conditioner and split type air conditioner.
27. Explain any three manufacturing processes in detail.

2 x 10 = 20 Marks

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2021

BMT1C01 – Mathematics – I

(2019 Admission onwards)

Time: 2 hours

Max. Marks : 60

Section A

All questions can be attended

Each question carries 2 marks

1. Find the slope of the tangent line to the graph of $f(x) = x^2 + 1$ at $x_0 = -1$.
2. Find $\lim_{x \rightarrow \infty} \frac{2x + 1}{3x + 1}$.
3. Find $\frac{d}{dx}(10x^3 - \frac{8}{x} + 5\sqrt{x})$.
4. Differentiate $g(x) = (9x^3 + 10)^{\frac{5}{3}}$.
5. Find the general antiderivative for the function $f(x) = x^4 + 6$.
6. Find $\int 4x^{\frac{3}{2}} dx$.
7. State whether the function $f(x) = x^4 + 3x^2 + 6$ is even, odd, or neither.
8. State Mean Value Theorem.
9. Evaluate $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x^2}$.
10. Prove that $\sum_{j=3}^{102} (j - 2) = 5050$
11. Let $F(x) = \int_1^x \frac{1}{3 + s^2 + s^3} ds$. Find $F'(2)$.
12. Find the average value of $f(x) = x^2$ on $[0, 2]$.

(Ceiling: 20 Marks)

Section B

All questions can be attended
Each question carries 5 marks

13. Use linear approximation to calculate $\frac{1}{(1.99)^2 + (1.99)^4}$.
14. Find the equation of the line tangent to the parametric curve given by the equation $x = t^2, y = t^3$ at $t = 5$.
15. If $y = (x^2 + 1)^{27}(x^4 + 3x + 1)^8$, find the rate of change of y with respect to x .
16. Find the intervals on which $f(x) = x^3 - 2x + 6$ is increasing and decreasing.
17. Suppose that f is continuous on $[0, 3]$, that f has no roots on the interval, and that $f(0) = 1$. Prove that $f(x) > 0$ for all x in $[0, 3]$.
18. Find the area under the graph of $f(x) = 2x$ for $0 \leq x \leq 1$ using upper and lower sums.
19. Find the volume of the solid obtained by revolving the region under the graphs of $\sqrt{3 - x^2}$ and $5 + x$ on $[0, 1]$ about the x axis.

(Ceiling: 30 Marks)

Section C

Answer any one question
Question carries 10 marks

20. (a) Find the equation of the line tangent to the graph of the function $f(x) = \frac{(\sqrt{x} + 1)}{2(x + 1)}$ at $x = 1$.
- (b) Find $\int \left[\frac{2}{x^2} + 7x^2 - 3x + 2 - \frac{9}{\sqrt{x}} \right] dx$.
21. (a) Find the interval on which $f(x) = 3x^3 - 8x + 12$ is concave upward and downward. Also find local maxima, local minima and inflection points.
- (b) Find the area between the graphs of $y = x^3 + 1$ and $y = x^2 - 1$ between $x = -1$ and $x = 1$.

(1×10 = 10 Marks)