Code No. 424/CBCS

FACULTY OF ENGINEERING

BE-III Semester (Except I.T) (CBCS) (Main) Examination, December 2017

Subject: Engineering Mathematics-III

Time: 3 Hours **Max.Marks: 70**

Note: Answer All Questions From Part-A & Any Five Questions From Part-B.

PART-A (20 Marks) (10x2=20M)

1 Determine the value of k such that
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$$f(z)=\frac{1}{2}\log(x^2+y^2)+i\tan^{-1}(\frac{kx}{y})$$ is an analytic function.

2 Evaluate $\int_c (\bar{z})^2$ where c is the straight line path joining O(0,0) to A (2,1).

3 Locate and classify the singularity of the function $f(z)=\frac{z-\sin z}{z^4}$

4 Find the residue of $f(z)=\left(\frac{z+1}{z-1}\right)^3$ at its pole.

5 Find the Half range Fourier Cosine series of the function

$$f(x)=\begin{cases} \frac{x}{2} \; if \; 0<x<\frac{®}{2} \\ ® -\frac{x}{2} \; if \; \frac{®}{2}<x<® \end{cases}.$$

6 State Dirichlet's conditions.

7 Form the partial differential equation by eliminating the arbitrary function f from $x+y+z=f(x^2-y^2+z^2)$.

8 Find the complete integral of $p(1+q)=qz$.

9 Solve $3xu_x-4yu_y=0$.

10 Classify the partial differential equation

$\frac{\partial^2 u}{\partial x^2} + 2\frac{\partial^2 u}{\partial x \partial y} + 4\frac{\partial^2 u}{\partial y^2} = 0$

PART-B (5X10=50 M)

11 a) Construct the analytic function $f(z) = u + iv$ if $u(x, y) = y^3 - 3x^2 y$. 5

b) Evaluate $\int_c \frac{\sin^2 z}{(z - \frac{®}{6})^3} dz$ where C is the Circle $|z| = 1$. 5

12 a) Expand $f(z) = \frac{1}{z^2 - 7z + 6}$ in the regions

(i) $|z| < 1$ (ii) $1 < |z| < 6$ (iii) $|z| > 6$. 6

b) Using Cauchy's residue theorem,

evaluate $\int_c \frac{z}{(z-1)(z-2)^2} dz$ where C is the Circle $|z - 2| = \frac{1}{2}$ 4

13 Find the Fourier series of the function $f(x) = 1 + x$ on $-1 \le x \le 1$ and hence deduce that $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + ... = \frac{®}{4}$. 10

14 a) Solve $(x^3 + 3xy^2)p + (y^3 + 3x^2 y)q = 2z(x^2 + y^2)$. 5

b) Solve $yz - pxy - pq - qy = 0$ by using Charpit's method. 5

15 Solve the wave equation $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$, $0 \le x \le l$, $t > 0$ subject to conditions 10

$u(0,t) = 0 = u(l,t)$, $u(x,0) = \begin{cases} x \text{ if } 0 \le x \le \frac{l}{2} \\ l - x \text{ if } \frac{l}{2} \le x \le l \end{cases}$ and $\frac{\partial u}{\partial t} = 0$ when t=0.

16 a) If $f(z) = u + iv$ is an analytic function then show that $(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2})|f(z)|^2 = 4|f'(z)|^2$ 5

b) Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2 + a^2)(x^2 + b^2)} dx$ where $a > 0, b > 0$ 5

17 a) Solve $[D^2 - 3DD' + 2(D')^2]z = \cos(x + 2y)$. 5

b) Find the complete integral and singular integrals of the partial differential equation $z = px + qy - pq$. 5

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Code No. 456/CBCS

FACULTY OF ENGINEERING

B.E III – Semester. (I.T) (CBCS) (Main) Examination, December 2017
Subject: Micro Electronics

Time: 3 Hours **Max. Marks: 70**

Note: (i) Answer All Questions From Part-A & Answer Any five Questions From Part-B.

PART – A (20 Marks)

1. Differentiate between intrinsic and extrinsic semiconductor.
2. Sketch the characteristics of PN junction diode in forward and reverse bias condition.
3. Briefly explain different modes of operation of BJT.
4. Draw the circuit symbol of JFET and MOSFET.
5. Define open loop gain and closed loop gain of feedback amplifier.
6. What are the properties of negative feedback amplifier?
7. Mention the ideal characteristics of op-amp.
8. Draw the circuit of Adder using op-amp.
9. What is Noise Margin?
10. Design the tree structure of digital IC technologies and logic circuit families

PART – B (5 x 10 = 50 MARKS)

11. a) Explain about clipper and clamper operations of an electrical circuit. [5]
    b) Explain the operation of Full Wave Rectifier. [5]
12. Write the complete details of physical structure, working and V-I characteristics of JFET
13. a) Explain Basic Transconductance (series-series) topology of negative feedback amplifier [5]
    b) Explain the operation of Hartley oscillator [5]
14. Explain the generation of square waveform using op-amp [10]
15. a) Explain Voltage Transfer Characteristics (VTC) of an inverter [5]
    b) Write details of basic structure of PUN and PDN. Justify with proper example. [5]
16. a) Give details how varactor diode acts like a variable capacitor under reverse bias? [5]
    b) Explain output characteristics of Common Base configuration of transistor? [5]
17. Write the short notes on any two of the following: [10]
    a) Op-amp as differentiator
    b) Colpitts oscillator
    c) Avalanche Breakdown

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Code No. 31

FACULTY OF ENGINEERING

B.E 2/4 (Civil) I – Sem (Back log) Examination, December, 2017

Subject : surveying – I

Time: 3 Hours **Max. Marks: 75**

Note: Answer All Questions From Part-A & Answer Any five Questions From Part-B.

Part - A (10x 2 = 25 Marks)

1. Define Chain Angle and Check Line? (2)
2. The distance measured between two points on a slopping ground is 150m. Find the correction to be applied and the horizontal distance if the slope is 1 in 10. (3)
3. What is the value of included angle POQ, if the bearings of the lines PO and OQ are respectively 10^o 21'10" and 100^o 50, 40", respectively. (3)
4. Differentiate dip and declination of magnetic needle? (2)
5. State the errors in plane table surveying. (2)
6. Briefly write the intersection method of plane table surveying. (2)
7. State the basic working principle of tilting level. (2)
8. What will be correction for refraction for a distance of 2000m? (3)
9. Draw typical contour lines showing a ridge line and over hanging cliff. (3)
10. The contour interval on a map is 15m. If the upward gradient on 1 in 15 is required to be drawn between two points, what will be the horizontal equivalent? (3)

Part - B (5 X 10 = 50 Marks)

11. a) A 30 m steel tape was standardized when fully supported under 8 kg pull at a temperature of 23^0C. The length measured was 3 km. Temperature at the measurement was 29 ^{0}C and the pull applied as 12.8 kg. Find the true length of the line, if cross sectional area of the tape was 0.03 sq. cm. The co – efficient of expansion of the tape material is 3.5×10^{-6} / ^{0} C and the young's modulus of the tape material is 2.01×10^6 kg/cm^2. (6)

b) Explain the working principle of Optical Square and state how it is useful in chain surveying. (4)

12. a) A closed compass traverse survey was conducted round a compound wall and the WCB were observed. Determine which of the stations are affected by local attraction and calculate their corrected bearings if the magnetic declination at the place is 3^0 30 W.

LINE	FORE BEARING	BACK BEARING
AB	32^0 30'	214^0 30'
BC	124^0 30'	303^0 15'
CD	181^0 01'	1^0 01'
DA	289^0 28'	108^0 45'

b) Define balancing of traverse? Write the method of distribution of closing error by Bowditch's method? (4)

13. a) Write the mechanical method of resection used for solving three point problem. (5)

b) Explain the two point problem with a sketch.

14. A page of an old level book had been damaged by white ants and the readings marked x are missing. Find the missing readings with the help of available readings and apply arithmetic check (10)

Distance(m)	BS	IS	FS	HI	RL	Remark
-	X			X	209.500	BM
0		1.675			X	
30		X			210.425	
60		3.355			209.080	
90	0.840		X	209.520	X	CP
120		X			208.275	
150		X			210.635	Underside of bridge girder
180	X		2.630	X	X	CP
210		X			206.040	
240		1.920			205.895	
270			X		205.680	

15 a) Write the characteristics and uses of counters with sketches? (5)

b) A series of offsets was taken from a base line to a curved boundary line at intervals of 10m in the following order : 2.70, 3.64, 3.70, 4.60, 3.62, 5.74m; Calculate the area surrounded by the curved line with the boundary and also compare the results with the trapezoidal rule. (5)

16 a) Explain the methods of direct and indirect methods of contouring with sketches. Also state their suitability based on the site conditions. (6)

b) Derive the expression used for measurement of area by simpson's rule. Draw sketches neatly.

17 The following readings were obtained from a reciprocal observations: The horizontal distance between A and B is 238 m and the RL of A = 200.85 m. Determine (a) True RL of B (b) Combined error due to refraction and curvature and (c) Error in the collimation adjustment of the instrument. (10)

Instrument at	A	B
Staff readings on A	1.660	2.180
Staff readings on B	0.536	1.750

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Code No. 33/O

FACULTY OF ENGINEERING

B.E. 2/4 (EE.Inst./MP/I.T.) I - Semester (Backlog) Examination, December 2017
Subject: Environmental Studies

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part A and any five questions from Part B.

PART-A (25 Marks)

1.	Differentiate between the Renewable and Non-Renewable resources.	(2)
2.	Define the term floods	(2)
3.	What is food chain? Give example	(2)
4.	What is an ecological pyramid?	(2)
5.	List the biogeographic zones of India	(3)
6.	What are vulnerable and exotic species?	(3)
7.	Define Necrosis and Epinasty	(3)
8.	State the purpose of Water act.	(3)
9.	Explain the water conservation and water management	(2)
10.	What is meant by disaster. Give two examples	(3)

PART-B (50 Marks)

11.	(a)	Explain the benefits and problems of dams	(5)
	(b)	What is meant by land degradation.? List the causes for the same.	(5)
12.	(a)	Describe salient features of pond ecosystem.	(5)
	(b)	Discuss various types of ecological succession.	(5)
13.	(a)	Briefly explain the values of biodiversity.	(5)
	(b)	Explain the different methods of conservation of biodiversity	(5)
14.	(a)	Define Water pollution and add a brief note on types of water pollutants	(5)
	(b)	Write and explain the salient features of Forest act.	(5)
15.	(a)	What What is an earth quake. Write its causes and measures to mitigate earthquake disaster.	(5)
	(b)	Expalin acid rain in depletion.	(5)
16.	(a)	Discuss the cause sand effects of thermal pollution	(5)
	(b)	Explain biogeochemical cycle in an ecosystem	(5)
17.	(a)	Write notes on ozone layer depltion	(5)
	(b)	Discuss the various types of soil erosion and methods to control it.	(5)

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Code No. 43

FACULTY OF ENGINEERING

B.E 2/4 (ECE) I – Semester Examination, December 2017

Subject : Electrical technology

Time: 3 Hours **Max. Marks : 75**

Note : Answer All Questions from part-A & Any Five Questions from Part - B

Part - A (10x 2 = 25 Marks)

1. Define the critical resistance of DC generator (2)
2. Mention the various types of DC motors with circuit diagrams (3)
3. In a two – Wattmeter measurement of the 3- phase power, one of the wattmeter is showing zero reading. Find the power factor (3)
4. What do you understand by 3 – phase balanced system (2)
5. Compare A.C generators and D.C generators (3)
6. Draw the vector diagram of an 3 – phase alternator at leading p.f. (2)
7. Write short notes on ideal transformer (3)
8. Mention the applications of auto transformer (2)
9. Define rotor current frequency of an 3 – phase induction motor (2)
10. What is the function of capacitor in a single phase induction motor (3)

Part - B (5 X 10 = 50 Marks)

11. a) Explain the various characteristics of DC shunt and series generators (5)
    b) Explain the constructional details and principle operation of DC generator (5)

12. a) Explain the speed control of DC shunt motor with help of neat circuit diagrams (5)
    b) A 5 H.P, 220 V, 1500 rpm, shunt motor has armature resistance including brushes is 0.07 Ω shunt field resistance is 110Ω and stray losses are 300 W. Calculate input at rated load and efficiency. (5)

13. a) With help of neat circuit diagram explain the two wattmeter method for 3- phase power measurement (5)
    b) Explain the operation of fluorescent lamp (5)

14. a) Derive the emf equation of an 3- phase alternator (5)
    b) Explain the armature reaction of an 3- phase alternator (5)

15. a) Explain the OC and SC tests conducted on transformer with help of neat circuit diagram and also explain how equivalent circuit and efficiency can be evaluated from above tests. (10)

16. a) A 20 HP, 440 V, 50 Hz, 4 – pole, 3 – phase induction motor runs at 1460 rpm on full load. The stator loss is 300 W and full load efficiency is 88%, Calculate full load slip and rotor cupper losses (5)

17. Write short notes on the following :
    a) Star/ delta starter for 3 – phase induction motor (4)
    b) Losses in DC machines (3)
    c) No load transformer (3)

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Code No. 49

FACULTY OF ENGINEERING

B.E 2/4 (A.E) I – Sem (Back log)) Examination, December, 2017

Subject : Computer Networks

Time: 3 Hours **Max. Marks: 75**

Note: Answer All Questions From Part-A & Answer Any five Questions From Part-B.

Part - A

1. Why LED is better than the conventional lighting system? 3
2. HRD test in batteries is carried out by 2
3. Starter motors take_____ current due to _____ torque 3
4. Starter motor pinion is made to rotate on over turning clutch type of arrangement because of _____ requirement, and hence known as _____ drive 4
5. Alternator uses 3 – unit regulator in its charging system (T/F) 3
6. Dynamo is comparatively less efficient than Alternator – why? 3
7. MPFI system is part of the modern electronic engine management system (T/F) 3
8. Electronic warning systems can be used for____, _____, _____ etc. 2
9. Microprocessors are used for _____ 2
10. Bring out the salient differential features in terms of construction and functioning between conventional lead acid battery and maintenance tre battery 10
11. Compare the working principles of Alternator and Dynamo and then bring out the functional superiority of the alternator and why 10
12. With a neat sketch, explain the working and functioning of a battery charging system 10
13. Bring out in details the different sub-systems of an automotive electronic engine management system as well as overall automotive functioning systems 10
14. a) Describe the sources of electro-magnetic interference as well as its effects on other systems 5
    b) Describe modern day coolant system which has replaced the day to day replenishment of water 5
15 a) Explain the working principle of solenoid with a neat sketch 5
    b) How exhaust analyzer functions 5
16. Write short notes on the following 10
    a) On board diagnostic system.
    b) Different security and warning system
    c) Microprocessor in automobiles.

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Code No. 53

FACULTY OF ENGINEERING

BE 2/4 (CSE) I- Semester (Supplementary) Examination, December, 2017
Subject: LOGIC AND SWITCHING THEORY

Time: 3 hours **Max. Marks: 75**

Note : Answer all questions from Part-A & Any Five Questions from Part-B.

PART – A (25 MARKS)

1	State and Prove Idempotent Law.	2
2	Distinguish between a Decoder and Encoder.	2
3	Draw the full adder circuit using two half adders and other logic gates	2
4	Define the term Essential Prime Implicant.	2
5	Determine the value of r. $(365)_r = (194)_{10}$.	2
6	Draw the equivalent AND and OR gates using NAND gates.	3
7	What are shift registers? Explain with diagram	3
8	Design a D type flip-flop using JK flip-flop.	3
9	Differentiate between synchronous and asynchronous counters.	3
10	Find a Contact network realization with minimum number of contacts for $S_{1,4}(w,x,y,z)$.	3

PART – B (50 MARKS)

11	Simplify the Boolean function to a minimum number of literals:		
	a)	$XY + X^1Z + YZ$, $ABC + A^1B + ABC^1$	5
	b)	Express the complement of the function given in sum o9f minterms and draw the logic diagram $F(x, y, z) = \sum m (0, 3, 6, 7)$.	5
12		Using Tabulation method generate set of prime implicants and obtain minimal expression for the function $F(w, x, y, z) = \sum m (0, 1, 4, 5, 6, 7, 9, 11, 15)$.	10
13		Design a full adder circuit using carry look ahead adder and draw the circuit.	10
14	a)	Implement the following function with a multiplexer: $F(A, B, C, D) = \sum m (0, 1, 3, 4, 8, 9, 15)$.	4
	b)	Minimize using k-maps $F(A, B, C, D, E) = m (0, 2, 3, 4, 5, 6, 7, 11, 15, 16, 18, 19, 23, 27, 31)$.	6
15	a)	Obtain the characteristic and excitation tables for RS, JK & D Flip-flops.	6
	b)	Write the VHDL code for full-Adder.	4

16 a) Write short notes on Parity Genetor and Checker. 5

b) Design a 4-bit Priority encoder circuit. 5

17. Use JK type flip-flop to design a binary counter with the following repeated binary Sequence: 0, 1, 2, 3, 4 5. 10

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