

FACULTY OF ENGINEERING**B.E 2/4 (Civil) I – Semester (Backlog) Examination, November / December, 2018****Subject : Surveying – I****Time : 3 hours****Max. Marks : 75****Note : Answer All Questions from Part – A, & Any Five Questions from Part - B****Part - A (25 Marks)**

1. What are the principles of surveying? (2)
2. Identify whether the triangle having sides AB = 45 cm, BC = 40 cm, CD = 46 cm is a well conditioned triangle or not. (3)
3. Define the terms local attraction and dip of the magnetic needle (2)
4. The magnetic bearing of a line is 60° . Calculate the true bearing if the magnetic declination is 5° East. (3)
5. What are the disadvantages of plane table surveying? (2)
6. Explain in detail about radiation method in plane table surveying? (3)
7. What is the sensitivity of bubble? (2)
8. Determine the distance between ship and tower, if an observer standing on a ship deck at a height of 3m sees the top of tower having a height of 55m. (3)
9. What are the effects of time and scale on contour interval? (2)
10. Define and state any two applications of grade contour (3)

Part - B (5 X 10 = 50 Marks)

11. a) What are the obstructions in chain surveying? Explain in detail (5)
 b) Two stations P and Q are on the main survey line were taken on the opposite sides of the pond. On the right of PQ, a line PR, 210 m long was laid down and another line PS, 260 m long was laid down on the left of PQ. The points R, Q and S are on the same straight line. The measured length of RQ and QS are 85 m and 75m, respectively. Compute the length of PQ (5)
12. a) Compare between prismatic compass and surveyors compass. (4)
 b) Find the correct bearings of sides in the traverse ABCDE and later calculate the included angles from the data given below (6)

Line	FB	BB
AB	S 15° W	N 17° E
BC	N 45° E	S 43° W
CD	N 21° E	S 21° W
DE	S 63° W	N 64° E
EA	S 20° W	N 21° E

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13. a) With neat sketches, describe the method of solving three – point problem by Bessel's method (10)
- 14.a) Explain the temporary adjustments of a Dumpy level (4)
- b) The following consecutive readings were taken with a level 3.85, 3.35, 2.95, 1.95, 0.85, 3.80, 2.55, 1.55, 1.90, 0.85 and 0.65. The first reading was taken on a B.M. whose R.L. is 100.000m. Calculate the R.L's of all points. If the total distance is 240m, find the gradient of the sloping line (6)
15. a) What are the characteristics of contour lines? Explain with sketches. (5)
- b) Calculate the volume of earthwork in an embankment of 50m length if the heights at 10m intervals are 3m, 2m, 4m, 3m, 4m, 2m, and 3m and is 10m wide with side slopes of $1\frac{1}{2} : 2$ (5)
16. a) The following observations were taken in reciprocal leveling: (5)

Instrument at	Staff reading at	
	A	B
A	1.625	2.545
B	0.725	1.405

Determine R.L. of 'B' if that of 'A' is 100.15. Also calculate the error in collimation if the distance between A and B is 1000m.

- b) Explain with sketches in detail about indirect method of contouring. (5)
17. Write short note on the following (10)
- a) Corrections in chain survey
- b) Bowditch's method
- c) Orientation in plane table survey.

FACULTY OF ENGINEERING**B.E. 2/4 (EEE/Inst. /MP/I.T) I-Semester (Backlog) Examination, Nov./ Dec. 2018****Subject: Environmental Studies****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part – A. & any FIVE questions from Part – B.****Part – A (25 Marks)**

1. Mention hotspots of biodiversity in India. 2
2. Distinguish between food chain and food web 3
3. What is meant by Eutrophication? 2
4. Briefly explain the necessity of watershed management. 3
5. Mention any two flood control measures. 2
6. Explain the effects of population explosion on sustainable development 3
7. What is Greenhouse effect? 2
8. Discuss the concept of “Endangered Species”. 3
9. Differentiate BOD and COD 3
10. Discuss the effects of Acid rains. 2

Part – B(5x10 =50 Marks)

11. a) Explain the need for public awareness about environment and its degradation. 5
b) What are the merits and demerits associated with the construction of major dams? 5
12. a) Define the term ecosystem. Explain the structural classification of an ecosystem. 5
b) What are ecological pyramids? Why are energy pyramids always upright? 5
13. a) Define biodiversity. Explain the classification of biodiversity. 5
b) Enumerate and explain the major threats to biodiversity. 5
14. a) Can you discuss the different causes which lead to water pollution? Explain the different methods to decrease water pollution in future? 5
b) Write a short note on noise pollution and their mitigation measures. 5
15. a) Write various types of disasters and disaster management cycle. 5
b) Write short notes on
(i) Rainwater harvesting (ii) Ozone layer depletion 5
16. a) Write short notes on:
(i) Soil erosion (ii) Biogas (iii) Geothermal energy 5
b) Define solid waste management. Write the classification of Solid wastes and their disposal methods. 5
17. a) Write about the environmental protection act 1986. 5
b) Write the principles of disaster mitigation. 5

FACULTY OF ENGINEERING**B.E. 2/4 (ECE) I – Semester (Backlog) Examination, November / December 2018****Subject: Electrical Technology****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part – A. Answer any FIVE questions from Part-B.****Part – A (25 Marks)**

1. What do you understand by armature reaction in dc generators? (3M)
2. Why starter is used in dc motors? Explain with the concerned equation. (2M)
3. The readings of two wattmeter's in 3 - ϕ measurement. Are 200 W and 150 W. Calculate the power factor. (2M)
4. Draw the vector diagram and prove that line voltage is $\sqrt{3}$ times the phase voltage in star connection. (3M)
5. Define voltage regulation of alternator. (2M)
6. What is meant by synchronous impedance of an alternator (3M)
7. Draw the no load phasor diagram of transformer and explain. (2M)
8. The 5 k VA, 300/150V single phase transformer has no load test reading of 40w and short circuit test reading of 100W. Find the efficiency at full load UPF. (3M)
9. Explain why single phase induction motors are not self starting? (2M)
10. What type of motor is used in following Applications: Washing machines, sewing machines, mixers, Give reasons. (3M)

Part – B (50 Marks)

11. a) Explain with neat sketch the construction of D,C Machine.
b) A 30 kW, 300 V D C shunt generator has armature and field resistance of 0.05Ω and 100Ω respectively. Calculate the total power developed by the armature, when it delivers full load output.
12. a) Explain how three phase power can be measured using two wattmeter method.
b) Explain the operation of fluorescent lamp with neat diagram.
- 13 a) Explain armature reaction in alternator.
b) Explain the construction of alternator with neat diagram.
14. a) Discuss principle of operation and applications of auto transformer.
b) A 10 k VA, 200/400V, 50 Hz. 1ϕ transformer has the following test results OC
Test: 200V, 1.3A, 120W on L.V. side
S.C. Test: 22V, 30A 200W on H.V. side
Calculate regulation and efficiency at 0.9 power factor lag of transformer. Also draw full load vector diagram.

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15. a) Explain double field revolving theory of single phase induction motor.
b) Explain the constructional features and principle of operation of capacitor start and run single phase induction motor.
16. a) Derive EMF equation of an alternator.
b) Discuss about characteristics of D.C. shunt motor.
17. a) Show that maximum efficiency in a transformer occurs when its variable losses are equal to constant losses.
b) Explain various power stages of in D.C. motor and derive condition for maximum efficiency.

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FACULTY OF ENGINEERING**B.E. 2/4 (CSE) I-Semester (Backlog) Examination, November / December 2018****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. Convert the decimal number to the indicated bases
 - a) 7562.45 to Octal
 - b) 175.175 to binary
2. Obtain the truth table of the following Boolean function $F = ((A^1+B)B^1+C)$.
3. Write the significance of parity bit?
4. What is essential prime implicant?
5. Distinguish between combinational and sequential circuit ?
6. Find a contact network realization with minimum number of contacts for $S_{1,4}(W,X,Y,Z)$.
7. Derive the excitation table of D and T flip flop?
8. What are Shift registers? Explain with diagram?
9. Differentiate between Synchronous and Asynchronous Counters.
10. Distinguish between a latch and flip flop.

PART-B (50 Marks)

- 11.a) Simplify the Boolean function using k-map method and draw logic diagram
 $F(A,B,C,D) = A^1B^1C^1 + B^1CD^1 + A^1BCD^1 + AB^1C^1$.
 - b) Show that the dual of ex-OR is equal to its component.
12. Design a combinational circuit to convert Binary code to Excess 3 code using four binary variables.
13. Simplify the function using tabulation method
 $F(A, B, C, D) = (1, 2, 3, 5, 7, 9, 10, 11, 13, 15)$
14. a) Write the VHDL code for full adder.
 b) Write short notes on parity generator and checker?
- 15.a) Express the following function in sum of minterms and product of maxterms : $F(X,Y,Z,W) = W^1(Y+X)X^1W^1$
 $F(A, B, C, D) = AB^1+C^1D^1$.
 b) Design a mod 6 counter with JK Flip flops.
16. A sequential circuit has two D-type flip-flops, an input X and an output Y. It can be specified by the following equation:
 $DA = Ax+Bx, DB = A^1x, Y = (A+B)x^1$.
17. Write short notes on
 - a) Verilog features
 - b) Priority encoder
 - c) Ripple carry Adder.

FACULTY OF ENGINEERING**B.E. (AE) 2/4 I-Semester (Backlog) Examination November / December 2018****Subject: Automotive Electrical and Electronics Engineering****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part – A & Any Five questions From Part - B****Part – A (2 x 10 = 25 Marks)**

1. What is trickle charging?
2. How are positive and negative plates identified in a battery?
3. Why is cranking motor series wound?
4. The efficiency of a battery is to deliver current. It depends on _____ and _____.
5. What is third brush regulation?
6. What is see beck effect?
7. What are the different instruction formats in 8085 microprocessor?
8. Why LED is better than conventional lighting system?
9. What is the principle aim of engine developer?
10. What is the function of starting motor drive?

Part-B (5 x 10 = 50 Marks)

11. Describe briefly various methods of battery testing? [10]
12. Briefly describe the salient characteristics of a battery? Explain with construction. [10]
13. a) Explain the working principle of a motor. [5]
b) Describe Bendix drive. How does it differ from Folo-Thru drive? [5]
14. Write short notes on
 - a) Generator Output Control [4]
 - b) Cut-Out relay [3]
 - c) Regulator [3]
15. Write a short notes on
 - a) Electromagnetic Interference & Electromagnetic Compatibility [5]
 - b) Dashboard system [5]
16. Discuss briefly various sensors used for position displacement and speed sensing in an engine? [10]
17. Write short notes on
 - a) Lighting system [4]
 - b) Horn [3]
 - c) Windscreen wiper [3]

FACULTY OF ENGINEERING

B.E. II – Semester (CBCS) (Supple.) Examination, Nov./Dec. 2018

Subject: Engineering Mathematics – II

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part A and Five questions from Part B.

PART – A (10x2 = 20 Marks)

- 1) Solve $\frac{dy}{dx} = \frac{1}{e^{-y} - x}$
- 2) Find the orthogonal trajectories of the family of curves $r = c\theta^2$
- 3) Solve $x^2 y'' + xy' - y = 0$
- 4) Find a particular integral of $(D^3 + D)y = x^2$
- 5) Using power series method, find the general solution of $y' = xy$ about the origin.
- 6) Evaluate $\int_{-1}^1 x^3 P_3(x) dx$
- 7) Prove that $B(m, n) = 2 \int_0^{\frac{\pi}{2}} x^5 \cos^{2m-1} x \sin^{2n-1} x dx$
- 8) Evaluate $\int x^5 J_4(x) dx$ in terms of Bessel's functions
- 9) Find $L\{\sin 2t \cosh 2t\}$
- 10) Obtain the inverse Laplace transform of $\frac{e^{-fs}}{s^2 + 1}$

PART – B (50 Marks)

11. a) Solve $xy dx + (x^2 + 2y^2 + 2)dy = 0, y(0) = 1$ 5
 - b) Find the general solution of the Riccati's equation $\frac{dy}{dx} = 3y^2 + (1 + 6x)y + 3x^2 + x + 1$ if $y = x$ is a particular solution 5
12. a) Solve the initial problem $y''' + 4y'' - 2y = 0, y(0) = 2, y'(0) = 2, y''(0) = -3$ 5
 - b) Solve $y'' + 4y' + 4y = e^{-2x} \sin x$ by the method of variation of parameters 5

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13. a) Prove that $P_n(x) = \frac{1}{2^n n!} \frac{d^n (x^2 - 1)^n}{dx^n} (x^2 - 1)^n$ 5
- b) Using the generating function of Legendre polynomial, prove that
 $P_{2n}(0) = (-1)^n \frac{1, 3, 5, \dots, (2n-1)}{2, 4, 6, \dots, 2n}$ and $P_{2n+1}(0) = 0$ 5
14. a) Prove that $\int_{-1}^1 (1-x^2)^n dx = \frac{2^{2n+1} (n!)^2}{(2n+1)!}$, n is a positive integer. 5
- b) Express $J_{-\frac{5}{2}}(x)$ in terms of sine and cosine functions. 5
15. a) Evaluate $\int_0^{\infty} \frac{e^{-t} - e^{-3t}}{t} dt$ 5
- b) Find $L^{-1} \left\{ \frac{1}{s^2(s^2 - 4)} \right\}$ using convolution theorem. 5
16. a) If the temperature of the air is 30°C and the substance cools from 100°C to 70°C in 15 minutes, then find the time at which the temperature will be 40°C . 5
- b) Solve $(D-1)^2 y = e^x (x^2 + \cos 2x)$. 5
17. a) Prove that $\frac{d}{dx} [x^{-n} J_n(x)] = -x^{-n} J_{n+1}(x)$ 5
- b) Find $L\{f(t)\}$, where $f(t) = \begin{cases} t, & 0 < t < 1 \\ 0, & 1 < t < 2 \end{cases}$ and $f(t+2) = f(t), t > 0$ 5
