G 6820 (Pages : 3) Reg. No ..... EEE .....

Name .....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

ENGINEERING MATHEMATICS—III (CMELRPTANSUF)

(Regular/Improvement/Supplementary)

(Common for all Branches)

Time : Three Hours Maximum : 100 Marks

Answer **one** *full question from each module.*
Statistical tables permitted.

Module I

1. (a) Solve $\left(1+y^2\right)dx = \left(\tan^{-1}y - x\right)dy$. (7 marks)

(b) Solve $(D^2 - 2D + 1)y = e^x \log x$ by the method of variation of parameters. (9 marks)

(c) Solve $y' + y \tan x = y^3 \sec x$. (4 marks)

Or

(d) Solve $\left[\left(1+\frac{1}{x}\right)y + \cos y\right]dx + [x + \log x - x \sin y]dy = 0$. (5 marks)

(e) Solve $\left(D^2 - 3D + 2\right)y = x^2 + e^x$. (7 marks)

(f) Using method of variation of parameters, solve $\frac{d^2y}{dx^2} + 4y = \tan 2x$. (8 marks)

Module II

2. (a) If $u = \sin^{-1}\left(\frac{x^2+y^2}{x+y}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \tan u$. (7 marks)

(b) Using Lagrange's undetermined multipliers find the maximum value of $x^2 + y^2 + z^2$ subject to $ax + by + cz = p$. (8 marks)

(c) Solve by Cherpit's method $(p^2 + q^2)y = qz$. (5 marks)

Or

(d) The two ends A and B of a rod 30 cm. long have the temperature at 40° C and 90° C until steady state prevails. The temperatures of the ends are changed to 50° C and 70° C respectively. Find the temperature distribution in the rod at time t. (20 marks)

Turn over

Module III

3. (a) Define Fourier transform of a function $f(x)$. Show that $F[f(x-\alpha)] = e^{i\alpha a} F(\alpha)$, where $F(\alpha)$ is the Fourier transform of $f(x)$.

(5 marks)

(b) Find the Fourier cosine transform of the function $f(x) = \begin{cases} \cos x, & 0 < x < a \\ 0, & x > a \end{cases}$. (7 marks)

(c) Verify the Parseval's identity for the function $f(x) = \begin{cases} 1, & \text{for } |x| \leq a \\ 0, & \text{for } |x| > a \end{cases}$. (8 marks)

Or

(d) Find the Fourier transform of : $f(x) = \begin{cases} 1 - x^2, & |x| \leq 1 \\ 0, & |x| > 1 \end{cases}$ (5 marks)

(e) Find the Fourier sine transform of $f(x) = \frac{e^{-ax}}{x}$, $a > 0, x \neq 0$ and hence show that $\int_0^\infty \tan^{-1}\left(\frac{x}{a}\right)(\sin x)dx = \frac{\pi}{2}e^{-a}$.

(8 marks)

(f) State and prove the convolution theorem for Fourier transforms. (7 marks)

Module IV

4. (a) If a random variable X has a Poisson distribution with parameter α, then prove that $E(x) = \alpha$, and $V(x) = \alpha$.

(5 marks)

(b) The probability that a patient recovers from a disease is 0.4. If 18 persons have such a disease, determine the probability that :

(i) exactly 6 survive.

(ii) at least 10 survive.

(iii) from 3 to 9 survive.

(10 marks)

(c) If X has normal distribution with mean m and variance s^2, find $P[\mu - \sigma < X < \mu + \sigma]$.

(5 marks)

Or

(d) Small electric motors are shipped in lots of 50. Before such a shipment is accepted, an inspector chooses 5 of these motors and inspects them. If none of these tested motors are defective, the lot is accepted. If one or more are found to be defective, the entire shipment is inspected. Suppose that there are, in fact, three defective motors in the lot, what is the probability that 100 % inspection is required ?

(10 marks)

(e) Suppose that the probability that an item produced by a particular machine is defective equal 0.2. If 10 items produced from this machine are selected at random, what is the probability that not more than one defective is found ?

(6 marks)

(f) Find the probability that 5 out of 10 persons are in favour of a given pirce of legislation given tha the sample is taken from 100 persons among whom 60 are for it.

(4 marks)

Module V

5. (a) Let $\bar{X}$ be the mean of a random sample of size "n" from a distribution which is $N(\mu, 9)$. Find n such that $P[\bar{X} - 1 < \mu < \bar{X} + 1] = 0.90$.

(10 marks)

(b) A set of five similar coins is tossed 320 times and the result is :

No. of heads	:	0	1	2	3	4	5
Frequency	:	6	25	74	110	73	32

Test the hypothesis that the data follow a binomial distribution at 0.05 level of significance.

(10 marks)

Or

(c) Fit a Poisson distribution to the following data and test for its goodness of fit at level of significance 0.05.

x	:	0	1	2	3	4
f	:	419	342	164	54	21

(10 marks)

(d) The voltage of a voltage source is measured 100 times and the mean voltage is found to be 230.14 V, with a standard deviation of 0.6 V. Test the hypothesis that the mean voltage of the source is 230 V at 0.05 level of significance.

[5 × 20 = 100 marks]

(ii) For the network function given below, draw the pole-zero diagram and hence obtain $i\ (t)$:

$$I(s) = \frac{20s}{(s+2)\ (s+5)}.$$

(6 marks)

MODULE 4

14. (a) (i) Give the complete mathematical procedure of determining the values of passive components in a constant K filter with a cut-off frequency f_c. Consider both T and π types.

(8 marks)

(ii) Find the z_0 for a π-network terminated with z_0 in terms of prototype impedances.

(4 marks)

Or

(b) Design a composite low pass filter to have a cut-off frequency of 700 Hz. and a characteristic impedance of 600 Ω. Use one constant-K, T section, one m-derived, T-section and two terminating half sections with $m = 0.6$. The frequency of infinite attenuation is 750 Hz. Draw the circuit diagram and insert all numerical values.

(12 marks)

MODULE 5

15. (a) What are the properties of RC impedance functions ? Realise the following driving point impedance $Z(s) = \frac{s^2 + 7s + 10}{s^2 + 4s + 3}$ in Foster II form and draw the network.

(12 marks)

Or

(b) (i) Check the positive realness of the function $Z(s) = \frac{s^2 + s + 6}{s^2 + s + 1}$. (4 marks)

(ii) A driving point impedance is given by $Z(s) = \frac{s(s^2+4)\ (s^2+6)}{(s^2+1)\ (s^2+5)}$. Obtain the first form of Cauer network and draw the same.

(8 marks)

[5 × 12 = 60 marks]

G 6823

(Pages : 4)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

Branch : Electrical and Electronics Engineering

NETWORK ANALYSIS AND SYNTHESIS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions briefly. Each carries* 4 *marks.*

1. Find the Laplace transform of (i) cos wt ; (ii) tan wt.

2. Find the inverse Laplace Transform of $\frac{s}{(s^2+4)\ (s+3)}$.

3. Explain the properties of Fourier transform.

4. Find the Fourier transform of $f_1(t) = \begin{cases} e^{at}, & t < 0 \\ e^{-at}, & t \geq 0 \end{cases}$.

5. Explain the importance of poles and zeros of a system transfer function on the time domain response.

6. What is a gyrator ? What are its applications ? Explain.

7. Define characteristic impedance ? What are its practical significances ?

8. Find the parameters of a T-section low pass filter having a zero frequency characteristic impedance of 600 Ω and a cut-off frequency of 900 Ω.

9. Check when $s^4 + 6s^3 + 5s^2 + 23\ s + 7$ is Hurwitz ?

10. Explain the procedure for testing whether a given function is position real or not ?

(10 × 4 = 40 marks)

Turn over

Part B

Answer **either** *Section (a)* **or** *(b) of each module.*
Each full question carries 12 *marks.*

MODULE 1

11. (a) In the circuit shown in Fig. 1, the switch is changed from position a to b at $t = 0$, after attaining steady state at position a. Find and sketch the current through the inductor for $t > 0$, using Laplace Transform method.

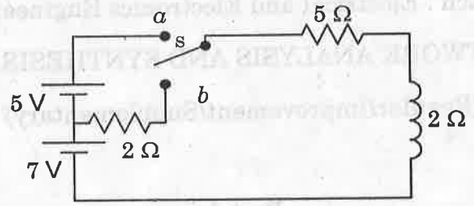

Fig. 1

(12 marks)

Or

(b) (i) Find the Laplace Transform of the function shown in Fig. 2.

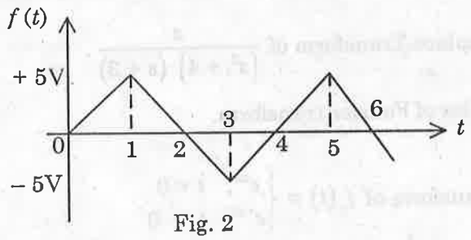

Fig. 2

(8 marks)

(ii) Find the Laplace inverse transform of $F(s) = \dfrac{1}{(s^2 + a^2)^2}$ using convolution integral.

(4 marks)

MODULE 2

12. (a) Determine the Fourier series for the periodic wave shown in Fig. 3. Plot the approximation of the waveform when N = 7.

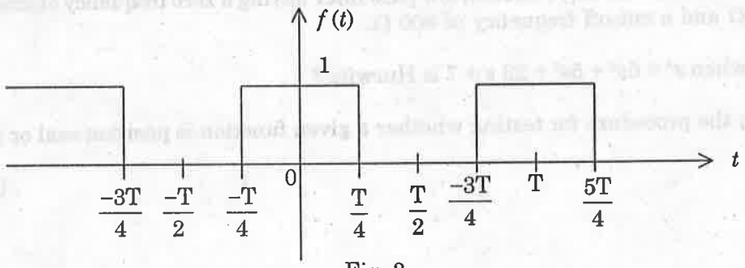

Fig. 3

(12 marks)

Or

(b) Plot the spectrum of the waveform shown in Fig. 4.

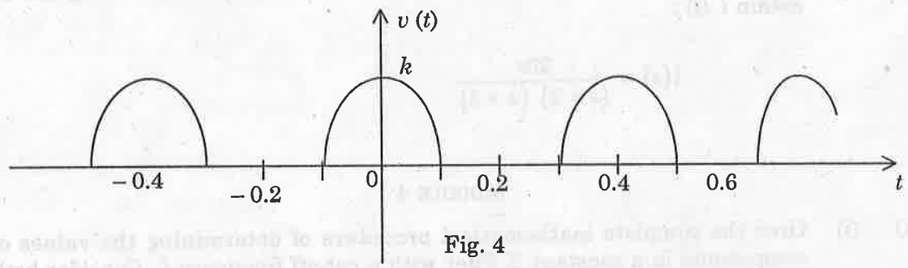

Fig. 4

(12 marks)

MODULE 3

13. (a) For the network shown in Fig. 5, determine the following functions :
(i) $Z_{11}(s)$; (ii) $Y_{11}(s)$; (iii) $G_{21}(s)$; (iv) $\alpha_{21}(s)$; (v) $Y_{21}(s)$; and (vi) the current transfer ratio.

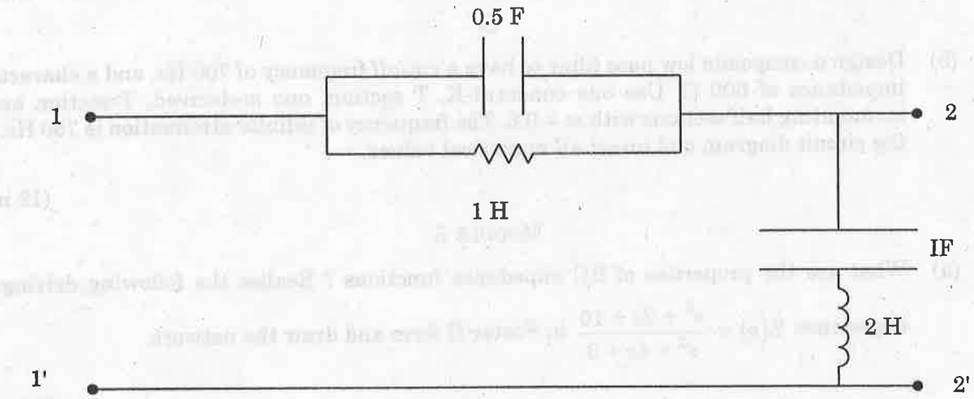

Fig. 5

(12 marks)

Or

(b) (i) Calculate the overll transmission parameters of the cascaded network shown in Fig. 6.

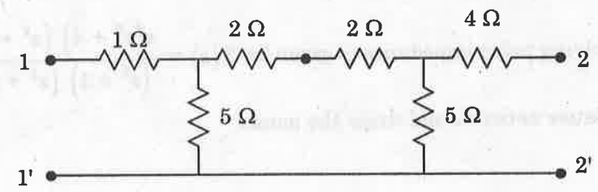

Fig. 6

(6 marks)

Turn over

(b) A 20 kVA, 2000/200 V, Single – phase transformer has the following parameters : —

HV Winding : $r_1 = 3\Omega$, $x_1 = 5.3\Omega$.

LV Winding : $r_2 = 0.05\Omega$, $x_2 = 0.05\Omega$.

(i) Find the voltage regulation at (i) 0.8 p.f. lagging (ii) u.p.f. (iii) 0.707 p.f. leading.

(ii) Calculate the secondary terminal voltage at (i) 0.8 p.f. lagging, (ii) u.p.f. (iii) 0.707 p.f. leading when delivering full load current with the primary voltage held fixed at 2 kV.

(12 marks)

Module 5

15. (a) Two 110 V, single–phase furnaces take loads of 500 kW and 800 kW respectively at a power factor of 0.71 lagging and are supplied from 6600 V, 3–phase mains through a Scott–connected transformer combination. Calculate the currents in the 3–phase lines, neglecting transformer losses ; Draw the phasor diagram.

(12 marks)

Or

(b) A step up autotransformer is used to supply 3 kV from a 2.4 kV supply line. If the secondary load is 50 A, neglecting losses and magnetizing current, calculate :

(i) Current in each part of the transformer.

(ii) Current drawn from the 2.4 kV supply line.

(iii) The kVA rating of the autotransformer.

(iv) The kVA rating of comparable conventional two-winding transformer necessary to accomplish the same transformation.

(12 marks)

[5 × 12 = 60 marks]

G 6843 (Pages : 4) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL MACHINES—I (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Give two reasons why the resultant flux entering an armature, whose conductors are carrying full load current, is less than the no-load flux.
2. Explain why the series motor must be started with a mechanical load coupled to its armature ?
3. With reference to the curve for buildup of a self-excited generator, explain (i) critical field resistance R_c ; (ii) field resistance higher than R_c ; and its effect on buildup.
4. State four specific reasons why a self excited shunt generator will not build up voltage.
5. Give four reasons why the armature connections are selected for reversal of motor direction rather than the field connections of d.c. motors.
6. Explain the fields method of testing DC series machines.
7. Why is it necessary to maintain the peak value of both mutual flux and flux density at a constant value, regardless of frequency changes ?
8. State the relation between secondary and primary impedances of a transformer. Why transformers must have primary and secondary internal resistance ?
9. Give three purposes for the use of tertiary windings in power transmission and distribution transformers.
10. Which of the two powers is responsible for the increase in kVA using an auto transformer over a conventional isolation transformer ? Explain.

(10 × 4 = 40 marks)

Part B

Answer **either** *Section* (a) **or** (b) *from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) (i) Give two disadvantages of running a dynamo at a speed lower than rated speed. Explain.

(4 marks)

(ii) A shunt motor develops a total torque of 250N-m at rated load. When it is subjected to a 15% decrease in field flux, the armature current increases by 40%. Calculate the new torque produced as a result of the change in field flux.

(8 marks)

Or

(b) A 125 V, d.c., 5 kW two-pole generator has a total of 1800 armature conductors on the periphery of its armature. The coil sides span exactly 180 electrical degrees on each coil. Neglecting the field current, calculate :

(i) armature ampere turns per pole when rated armature current is delivered by the generator.

(ii) demagnetising and cross-magnetising ampere turns per pole when the brushes are shifted 5 electrical degrees from the neutral (no-load) plane.

(iii) demagnetising and cross-magnetising (distortion component) ampere turns per pole when the brushes are shifted 10 electrical degrees.

(12 marks)

Module 2

12. (a) A 50 kW, 250 V, separately excited generator has an armature resistance of 0.05Ω, a brush drop of 6 V, and an armature reaction voltage drop of 20 V at rated load. Assuming a linear armature reaction effect with load, calculate :

(i) armature circuit voltage drop at full load, 1/4, 1/2, 3/4 and no-load.

(4 marks)

(ii) armature reaction voltage drop at the load conditions given in the above part (i).

(4 marks)

(iii) generated armature voltage at each of the load conditions given in the above part (i).

(4 marks)

(b) (i) Derive an expression for the maximum efficiency of a d.c. generator. (4 marks)

(ii) A 4-pole shunt generator with lap-connected armature having field and armature resistances of 50Ω and 0.1Ω respectively, supplies sixty 100 V, 40 W lamps. Calculate the total armature current, the current per armature path, and the generated electromotive force. Allow a contact drop of 1V per brush.

Module 3

13. (a) A starter is to be designed for a 10 kW, 250 V shunt motor. The armature resistance is 0.15Ω. This motor is to be started with a resistance in the armature circuit so that during starting period the armature current does not exceed 200% of the rated value or fall below the rated value. That is, the machine is to start with 200% of armature current and as soon as the current falls to the rated value, sufficient series resistance is to be cut out to restore current to 200% (or less in the last step). The process is to be repeated till all the resistance is cut out.

(i) Calculate the total resistance of the starter.

(ii) also calculate the resistance to be cut out in each step in the starting operation.

(12 marks)

Or

(b) (i) Hopkinson's test on two machines gave the following results for full load ; line voltage 250 V, line current excluding field current 50 A, motor armature current 380 A, field currents 5 and 4.2 A. Calculate the efficiency of each machine. The armature resistance of each machine = 0.02Ω. State the assumptions made.

(7 marks)

(ii) A retardation test is conducted on a separately excited motor. The induced voltage falls from 400 to 380 V. (i) in 65 sec opening the armature circuit, (ii) in 40 sec on suddenly changing the armature connections from the supply to a resistance taking 10A. Calculate the constant losses of the motor.

(5 marks)

Module 4

14. (a) A 50 kVA, 2200/110 V transformer when tested gave the following results : —

OC test, measurements on LV side : 400 V, 10 A, 110 V

SC test, measurements on HV side : 800 V, 20 A, 90 V

Compute all the parameters of the equivalent circuit referred to the HV and LV sides of the transformer. Draw the equivalent circuit and phasor diagram.

(12 marks)

Or

G 6861 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL AND ELECTRONIC INSTRUMENTS (E)

(Regular/Improvement/Supplementary/)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each carries 4 marks.

1. Explain electromagnetic damping and compare it with air friction damping ?
2. What are integrating instruments ? Explain with an example.
3. Discuss the errors and its sources in a dynamometer type moving coil instrument.
4. Give a comparison of attraction and repulsion type instruments.
5. What is current sensitivity ? How it can be increased ?
6. Explain the meaning of compensation winding in a wattmeter ? How it helps to reduce error ?
7. A PMMC ammeter gives reading of 35mA when connected across two opposite corners of bridge rectifier, the other corners of bridge rectifier, the other two corners of which are connected in series with a capacitor to 100 kV, 50 Hz supply. Determine the capacitance ?
8. Discuss the applications of CRO ?
9. In a synchroscope it is observed that pointer is revolving once in every second. What is the frequency of the incoming machine ?
10. Explain the principle of a rotating type phase sequence indicator ?

(10 × 4 = 40 marks)

Part B

Answer **either** *Section (a)* **or** *(b) from each module.*
Each full question carries 12 *marks.*

MODULE 1

11. (a) (i) With neat diagrams, explain the working principle of a moving iron indicating instrument. Show that this type of instrument can be used both for dc and ac measurements. Also indicate the errors involved.

Or

(b) (i) State and explain the classification of electrical measuring instruments ?

(4 marks)

(ii) The torque of an ammeter varies as the square of the current through it. If a current of 5A produces a deflection of 90°, What deflection will occur for a current of 3A when the instrument is (1) Spring controlled ; (2) gravity controlled ?

(4 + 4 marks)

MODULE 2

12. (a) With neat diagrams describe the construction and working of a PMMC type of instrument. Derive the expression for deflection for a PMMC ammeter if it is (i) spring controlled (ii) gravity controlled ? Comment upon the shape of scales in both cases :

(12 marks)

Or

(b) (i) Explain the working principle of moving iron type of voltmeter with a neat diagram :

(6 marks)

(ii) Design an Ayrton shunt to provide an ammeter with current ranges of IA, 5A and IOA. A basic meter with an internal resistance of 50Ω and a full scale deflection current of 1mA is to be used.

(6 marks)

MODULE 3

13. (a) (i) Discuss the various types of errors and their methods of compensation in a dynamometer type wattmeter.

(6 marks)

(ii) Describe the three-ammeter method for measurement of power and power factor in a single-phase circuit. Derive the expressions for the power and power factor ?

(6 marks)

Or

(b) Describe the construction of an induction wattmeter with the help of a neat diagram. What is the function of copper shading band ? Prove that the torque produced is proportional to the power in the circuit.

(12 marks)

MODULE 4

14. (a) A resistance 50Ω is connected in series with a rectifying device, a moving coil ammeter and a dynamometer type ammeter. The circuit is connected across a sinusoidal AC supply of 100V. The resistance of the rectifying device is 50Ω in one direction and 250Ω in the opposite direction.

Calculate : (i) reading on two ammeters.
(ii) power supplied from mains.
(iii) power dissipated in rectifying elements.

(12 marks)

Or

(b) With a neat detailed block diagram, explain the functioning of a CRO. Show how the amplitude, frequency and phase measurements are taken ?

MODULE 5

15. (a) Explain with neat sketch, the construction and principle of a dynamometer type single phase power factor meter. How would the accuracy of such an instrument be affected by frequency and waveform variation ?

(12 marks)

Or

(b) (i) Explain the working of a frequency meter, which depends for its action on the phenomenon of electrical resonance ?

(6 marks)

(ii) Draw a neat sketch of a Weston synchroscope and explain its working.

(6 marks)

[5 × 12 = 60 marks]

G 6852

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

Branch : Electrical and Electronics Engineering

COMPUTER PROGRAMMING (E)

(Regular/Improvement/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Write neat and efficient C programs wherever necessary.

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. List the rules to be followed while declaring variables in C, giving valid and invalid examples.
2. What is conditional operator ? Give its syntax and explain with the help of an example.
3. What is the necessity of a return statement ? Illustrate with an example.
4. Explain automatic, external and static variables.
5. Describe strcat and strten with examples.
6. With examples, explain how do we initialise 1 D and 2 D arrays.
7. What are the differences between pass by value and pass by reference ?
8. What are data files ? What are the advantages of using a data file ?
9. What is a structure tag and what is its purpose ? Explain with an example.
10. Why do we need a self-referencing pointer to create linked list ?

(10 × 4 = 40 marks)

Part B

Answer **either** *Section* (a) **or** (b) *from each module.*
Each full question carries 12 *marks.*

Module 1

11. (a) Write a C program to calculate the index marks of a candidate using the formula.

$$\text{Index marks} = \frac{\text{Maths}}{2} + \frac{\text{Physics}}{2} + \frac{\text{Chemistry}}{2} + \text{Entrance mark}$$

Or

(b) Write a C program to calculate the average of the best three marks from the given four test marks.

Turn over

Module 2

12. (a) Write a C program to generate and print the multiplication table for 8 upto 20 numbers.

Or

(b) Write a C program to evaluate π from the series $\frac{\pi^2}{6} = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \ldots\ldots\infty$ Add successive terms in the series until the value of the next term becomes smaller in magnitude than 10^{-5}.

Module 3

13. (a) Write a C program to read a sentence and delete all the vowels in it. Assume that the sequence is not more than a 80-character string ?

Or

(b) Write a program to read an $m \times n$ matrix column-wise, then transpose the matrix and get the output printed rowwise in a matrix form.

Module 4

14. (a) Write a C program to read the names of N students, sort them in alphabetical order using pointers.

Or

(b) Write a C program to create a data file with data fields employee name, id no, salary. Also write a routine to update the salary by a new salary amount.

Module 5

15. (a) Write a program using structures to read the following information of 300 employees : Employee name, employee number, experience and salary. The program should print the number and names of all the employees who have 5 years or more experience but salary less than 25,000.

Or

(b) Explain the process of dynamic memory allocation using MALLOC, CALLOC and REALLOC. How to release the used space ? Explain with examples.

(5 × 12 = 60 marks)

G 6833 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fourth Semester

Branch—Electrical and Electronics Engineering

ELECTRONIC CIRCUITS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Compare the input and output resistances of CB and CE configurations, giving typical values.
2. Calculate the current stability factor of a potential divider bias amplifier circuit with V_{cc} = 12 V, R_1 = 18 K, R_2 = 100 K, R_c = 4.7 K, R_E = 1 K, C_E = 220 μF.
3. Write the expressions for the *h*-parameters of CB configuration in terms of the CE configuration.
4. What is the lower cut-off frequency of a 3 stage RC coupled amplifier each stage having lower cut-off at 50 Hz ?
5. List the four types of negative feedback and identify which kind of gain is being independently controlled in each case ?
6. Which type of oscillators can provide maximum stability in the frequency ? Give reasons.
7. Compare and contrast the base and collector triggering methods in a bistable multivibrator.
8. Prove that an RC differentiating circuit can act as a high-pass filter ?
9. What is cross-over distortion ? How it can be eliminated ?
10. Compare the efficiencies and amount of distortions in class A, B, C and AB power amplifiers.

(10 × 4 = 40 marks)

Part B

Answer **either** *section* (*a*) **or** (*b*) *of each module.*
Each full question carries 12 *marks.*

MODULE 1

11. (a) (i) What is Quiescent point in a transistor amplifier ? How it is achieved ? What are the factors that determine the bias stability ? Obtain an expression for I_c in terms of I_B and I_{co} ?

(8 marks)

(ii) What is thermal runaway ? Explain clearly. (4 marks)

Or

Turn over

(b) Draw the a.c. equivalent circuit for Fig.1. Determine the voltage gain, output voltage, input resistance and output resistance if v_{in} = 100 mV.

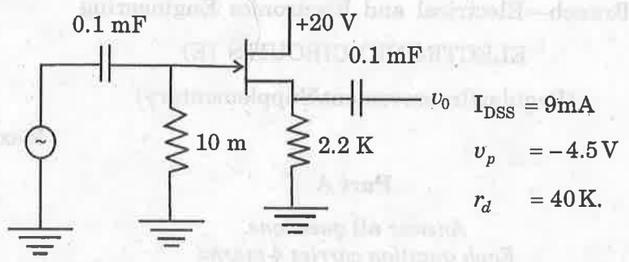

Fig.1.

(12 marks)

MODULE 2

12. (a) A common emitter transistor amplifier circuit has the following parameters : h_{ie} = 1000 Ω, h_{fe} = 100, h_{re} = 2.5 × 10^{-4}, h_{oe} = 2.5 × 10^{-5} V. If the load resistance R_L = 10 K and source resistance is 100 Ω, calculate input resistance, output resistance, voltage, current and power gains.

(12 marks)

Or

(b) Why do you cascade the amplifiers ? Draw a transistor version of an RC coupled amplifier, show that the gain bandwidth product of the amplifier is fixed by device parameters.

(12 marks)

MODULE 3

13. (a) Distinguish between "voltage" and "current" feedback in amplifier circuits. State the merits of each and for each case derive the expression for the net output impedance of the amplifier showing the influence of feedback.

(12 marks)

Or

(b) Draw the circuit of a RC phase-shift oscillator using BJT and explain how the Barkhausen criteria are satisfied ? State the conditions for sustained oscillation in the circuit ?

MODULE 4

14. (a) Draw the circuit of a Monostable multivibrator with base trigger with necessary waveforms explain its working.

(12 marks)

Or

(b) With neat circuit diagrams and waveforms explain how a UJT oscillator produces linear sweep ? Derive. expression for the sweep period.

(12 marks)

MODULE 5

15. (a) With the help of a circuit diagram explain the working of a class C power amplifier. Explain its merits and demerits.

(12 marks)

Or

(b) (i) Prove that a class A power amplifier is cooler in the presence of signal than in the absence of signal ?

(6 marks)

(ii) With a neat circuit diagram, describe how a complementary-symmetry class AB power amplifier works ?

(6 marks)

[5 × 12 = 60 marks]