G 1532 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Fourth Semester

EN 010 401—ENGINEERING MATHEMATICS–III

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

(Common for all branches)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 3 *marks.*

1. Find the fourier series of $f(x) = x(2l - x)$ in $(0, 2l)$.
2. Find the Fourier Cosine Transform of e^{-ax}. $(a > 0)$.
3. Form the partial differential equation by eliminating the arbitrary function 'f' from $f(z - xy, x^2 + y^2) = 0$.
4. Find the binomial distribution which has mean 2 and variance 4/3.
5. Define type I and type II error.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 *marks.*

6. Find the Fourier series expansion of $f(x) = x^2 + x$ in $(-2, 2)$.
7. Find the Fourier transform of unit step function.
8. Solve $x^4 p^2 - yzq - z^2 = 0$.
9. A random variable X has a Poisson distribution of $\sqrt{2}\,P(X \leq 1) = P(X \leq 2)$ find $P(X = 0)$.
10. A random sample is taken from a normal population with mean 30 and standard deviation 4. How large a sample should be taken of the sample is to be between 25 and 35 with probability 0.98 ?

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*

Each full question carries 12 *marks.*

11. Find the Fourier series $f(x) = |\cos x|$ in $-\pi \leq x \leq \pi$.

Or

12. Find the Fourier series expansion of :

$$f(x) = \begin{cases} 1, & 0 < x < 1 \\ 2, & 1 < x < 3. \end{cases}$$

13. Find the Fourier Transform of $f(x)$ if :

$$f(x) = \begin{cases} 1 - |x| & |x| < 1 \\ 0, & |x| > 1, \end{cases}$$

Hence prove that $\int_0^\infty \frac{\sin^4 x}{x^4}\, dx = \frac{\pi}{3}$.

Or

14. Find $f(x)$ of its Fourier sine transform is $\frac{s}{s^2+1}$.

15. Solve $z^2 (p^2 + q^2 + 1) = c^2$.

Or

16. Solve $(pq - p - q)(z - px - qy) = pq$.

17. In a normal distribution 7% of the items are under 35 and 10% of the items are above 55. Calculate the mean and variance.

Or

18. Fit a Binomial distribution to the following frequency distribution :

x :	0	1	2	3	4	5	6
f :	13	25	52	58	32	16	4

19. Two independent samples of size 7 and 8 item here the following values :

Sample I :	10	12	10	14	10	9	8	
Sample II :	9	11	11	13	15	9	12	14

Do the estimates of means of population differ significantly at 5% level of significance.

Or

20. The mean life time of a sample of 9 items is 49.11 and standard deviation 2.47. Does this mean value differ significantly from the assured mean value 47.5.

(5 × 12 = 60 marks)

G 1558 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Fourth Semester

Branch : Information Technology

IT 010 403—COMPUTER ORGANISATION AND ARCHITECTURE (IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Explain the differences between assembly language programming and Machine language programming.
2. Explain how interrupts affect instruction cycle.
3. Explain the Memory hierarchy.
4. What are the poets ? Explain serial and parallel port.
5. Explain briefly the issues in Interconnection Network.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the functional components of a computer.
7. What is a control unit ? Describe in detail Hard wired control unit.
8. Differentiate between SRAM and DRAM memory.
9. Write notes on serial and parallel pact.
10. Explain Instruction level parallelism.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. (a) Explain the different addressing modes. Give examples.

Or

(b) What are the typical elements of a machine instruction ? Explain.

Turn over

12. (a) What are memory sub systems ? Explain the organization of a memory chip.

Or

(b) What is virtual memory ? Explain virtual memory address translation.

13. (a) Explain the design of Hard wired control unit.

Or

(b) Explain Microprogrammed control unit.

14. (a) Explain briefly the different I/O control mechanisms.

Or

(b) Describe in detail the various input output devices.

15. (a) What is pipelining ? Explain the hazards in pipelining.

Or

(b) Discuss in detail the characteristics and memory organization of multiprocessors.

(5 × 12 = 60 marks)

G 1603 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Fourth Semester

Branch : Information Technology

LINEAR INTEGRATED CIRCUITS AND APPLICATIONS (T)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Sketch the frequency response characteristics of a practical op-amp. What is the open-loop bandwidth ?
2. Define CMRR. How can you improve it ?
3. Draw the circuit of an op-amp regenerative comparator and show its voltage transfer characteristics.
4. Compare and contrast the properties of Butterworth and Chebyshev filters.
5. Explain the following for a DAC :

   (i) Settling time ; (ii) Conversion time ; and (iii) Resolution.
6. Why the dual slope converters are the slowest ? What are its advantages ?
7. Explain the principle of dual tracking regulator.
8. Draw the circuit of a Zener shunt voltage regulator and explain the necessity of the series resistor R_s.
9. Clearly explain the role of low pass filter in a PLL.
10. Which is usually larger-lock range or capture range ? Give reasons.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. Explain the following parameters of op-amp, giving typical values in ideal and practical cases :

    (i) Input offset current. (ii) Input bias current.

    (iii) CMRR. (iv) PSRR.

    Or

Turn over

12. With waveforms and necessary diagrams, explain the working of precision half-wave and full-wave rectifiers.

13. Explain the working of a multiple feedback band pass filter. Derive the design equations for this circuit and design the same for f_0 = 300 Hz, Q = 20.

Or

14. With an integrator and regenerative comparator, draw a circuit which can generate triangular and square wave voltages. Derive the expressions for its frequency and sweep amplitude.

15. Draw the circuit of a four-quadrant analog multiplier and explain its working.

Or

16. With a circuit diagram, explain the working of a 3 bit flash ADC. What are its drawbacks ?

17. With a neat circuit diagram, drawn using BJT, explain a series pass linear voltage regulator having feedback and overload protection.

Or

18. With neat diagrams and waveforms, explain the working of a switching voltage regulator. Discuss its merits and demerits.

19. Explain any three circuit applications of PLL.

Or

20. (a) Draw and explain IC power amplifier. (4 marks)

(b) Draw and explain the circuit of a phase comparator used in PLL with necessary waveforms. (8 marks)

[5 × 12 = 60 marks]