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Question Paper Code: 93021

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Mechanical Engineering

19UMA321 - PROBABILITY, STATISTICS & PARTIAL DIFFERENTIAL EQUATIONS

((Regulation 2019))

(Statistical tables are may be permitted)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The degrees of freedom in t-tests is CO1- U
(a) n-1 (b) n-2 (c) n-3 (d) n-4
2. Large sample size is CO1- R
a) 30 b) >30 c) <30 d) none of these
3. Latin square design is a _____ CO2- R
a) One way b) Two way c) Three way d) None of these
4. SSE for Latin square design is CO2- R
(a) 0 (b) TSS-SSC (c) TSS-SSC-SSR (d) TSS-SSC-SSR-SSK
5. Probability of an impossible event is CO3- R
(a) 1 (b) 10 (c) 0 (d) 100
6. Correlation Coefficient value lies between CO3- R
(a) 0 to 1 (b) -1 to 0 (c) -1 to 1 (d) None of these
7. The PDE obtained from $z = (x+a)(y+b)$ is _____. CO4- R
(a) $3z = px + qy$ (b) $py - qx = 0$ (c) $3z = px + qy$ (d) $py - qx = 0$

8. The PDE of all planes having equal intercepts on the X axis and Y axis is _____ CO4- R
 a) $p = q$ b) $p + q = 0$ c) $p = q$ d) $p + q = 0$
9. Classify the equation $u_{xx} + u_{yy} = 0$ is _____ CO5- R
 (a) parabolic (b) hyperbolic (c) elliptic (d) cyclic
10. In a one dimensional wave equation, $c^2 =$ _____. CO5- R
 (a) T^2/m^2 (b) T/m (c) T/m^2 (d) T^2/m

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. The table gives the number of aircraft accidents that occurred during the various days of the week. Test whether the accidents are uniformly distributed over the week. CO1- App (8)

Days	Mon	Tue	Wed	Thu	Fri	Sat
No.of. accidents	14	18	12	11	15	14

12. Analyze the variance in the latin square of yields(in kgs) paddy where P,Q,R,S denote the different methods of cultivation. CO2- App (8)

S122	P121	R123	Q122
Q124	R123	P122	S125
P120	Q119	S120	R121
R122	S123	Q121	P122

13. Define Binomial distribution. Find the moment generating function and hence find mean and variance. CO3- Ana (8)
14. Solve $(D^2 - 5DD' + 6D'^2)z = e^{x+y}$ CO4- App (8)
15. A String is stretched and fastened to two points 1 apart. Motion is started by displacing the string into the form $y = K(lx - x^2)$ from which it is released at $t = 0$. Find the displacement of any point at a distance 'x' at any time 't'. CO5- U (8)