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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2019 | | | | | |
| **Course Code: MA206** | | | | | |
| **Course Name: PROBABILITY & STATISTICS AND NUMERICAL METHODS**  **(BT, FT, MT)** | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
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| **PART A** | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | Marks |
| 1 | a) | k=1/49 (2marks)  P(X< 4)= 16/49 (2marks) (c) P(3 ≤ X≤ 6)= 40/49 (3 marks) | | | (7 ) |
|  | b) | is a mistake. So evaluator can give 8 marks to correct F(x) values in first 3 interval  by  (for calculating 0 and 1 ,1mark each. For other values 2 marks each) | | | (8 ) |
| 2 | a) | |  |  |  |  |  | | --- | --- | --- | --- | --- | | X | 0 | 1 | 2 | 3 | | f(x) | 1/6 | 1/2 | 3/10 | 1/30 |   (3 marks)  P(X< 1)= 1/6 (2 marks)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | X | 0 | 1 | 2 | 3 | | F(x) | 1/6 | 4/6 | 58/60 | 1 |   (3 marks) | | | (8) |
|  | b) | (1 mark)  (i)P(X>10,000)= e-0.5 =0.6065 (3 marks)  (ii) 1- P(X>10,000) = 1- e-0.5 =0.527 (3 marks) | | | (7) |
| 3 | a) | Proof - 7marks | | | (7) |
|  | b) | (a) P(70< X <72) =0.1554 , number of workers =155 (3 marks)  (b) P(X >75) =0.1587 , number of workers =159 (3 marks)  (c) P(X < 63) =0.0808 , number of workers =81 (2 marks) | | | (8) |
| **PART B** | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | |
| 4 | a) | (i)explanation 2marks  (ii) proof 5 marks | | | (7 ) |
|  | b) | Null hypothesis  Against alternative hypothesis (1 mark)  critical region is (1mark)  = = 2.082 (4 marks)  =1.65 satisfies critical region . reject (2 marks) | | | ( 8) |
| 5 | a) | follows (1mark )  = follows (1mark )  P{25<<35}= 0.98 (1mark )  Implies P{-2.33<<2.33}= 0.98 (3marks )  n= 3.47= 4 (2 marks) | | | (7 ) |
|  | b) | Null hypothesis (1mark )  Against alternative hypothesis (1 mark)  critical region is (1mark )  = = -2.52 (3 marks )  =-2.33 reject (2 marks) | | | (8) |
| 6 | a) | =1.65 (2 marks)  Confidence interval is , } = (78.25,84.15) (5 marks) | | | (7) |
|  | b) | Null hypothesis against (2 marks)  Critical region is (1 mark)  = 1.79 (3 marks)  =1.96 (1 marks) Accept (1 mark) | | | (8) |
| **PART C** | | | | | |
| ***Answer any two full questions, each carries 20 marks.*** | | | | | |
| 7 | a) | (2 marks)  (1 mark each) | | | ( 7) |
|  | b) | = 0.333 (1 mark)  Newton’s forward formula (1 mark)  Difference table (3 marks)  y(21) =0.3583 (2 marks) | | | ( 7) |
|  | c) | [29-13y-3z]  [37-5x -7z] (1 mark)  [43-11x –y]  Put y=0, z=0  After 5 iteration x= 0.4826, y= 1.01644, z=1.5946 (6 marks) | | | (7) |
| 8 | a) | Formula and substitution (2 marks)  Polynomial y = x (4 marks) | | | (6) |
|  | b) | Simpsons formula (1mark )  53.87 (4 marks) , actual value 53.6 (2 marks) | | | (7) |
|  | c) | |  |  |  |  |  | | --- | --- | --- | --- | --- | | n |  |  | ) | ) | | 0  1  2  3  4 | 0  0.025  0.05  0.075  0.1 | 1  1.025  1.0518  1.0806  1.1115 | 1  1.0756  1.1543  1.2366 | 1.025  1.0518  1.0806  1.1115 | | | | (7) |
| 9 | a) | One root lies between 0 and 1 (1mark)  = g(x) (1 mark)  hence iteration method converges (1 mark)  After 5 iterations x = 0.75488 (4 marks) | | | (7) |
|  | b) | (1mark)  root lies between 3 and 4 (1mark)  After 3 iterations =3.4482 (4 marks) | | | (6) |
|  | c) | Formula (2 marks)    (1 mark)  (1 mark) | | | (7) |