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| **FINAL 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: MA202** | | | | | |
| **Course Name: PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS** | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
| ***Normal distribution table is allowed in the examination hall.*** | | | | | |
| **PART A** (**MODULES I AND II**) | | | | | |
| ***Answer two full questions*.** | | | | | |
|  | | | | | |
| 1 | a) | P(X=0) = P(X>0) = P(X<0) = k-------------------(1)  k = 1/3-----------------------(2)  P(X=0) =1/3; P(X=1) = P(X=2) = P(X=3) = k1  k1+ k1+ k1=1/3  k1=1/9-----------(1)  similarly P(X= -1) = P(X= -2) = P(X= -3) = 1/9-------(1)   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | X | -3 | -2 | -1 | 0 | 1 | 2 | 3 | | P(X=x) | 1/9 | 1/9 | 1/9 | 1/3 | 1/9 | 1/9 | 1/9 | | F(X) | 1/9 | 2/9 | 3/9 | 6/9 | 7/9 | 8/9 | 1 |   and F(X)=0 for X< -3 ; F(X)=1 for X ≥ 3 | | | 2 |
|  | b) | np(1+q) =1.8---------------(1)  5p(2-p) =1.8----------------(2)  p = .2------------------(2)  q =.8 -------------(1)  P(X=x) = 5Cx(0.2)x(0.8)5-x x = 0,1,2,---,5 ------------(2) | | |  |
| 2 | a) | λ = np = 5(0.02) = 0.1----------------(1)  **P(X=x)=------------(1)**  **(i**) P(X2/2 )  = 0.99 --------------------------------(3)  P(X1- P(X>=1- P(X=5)  =0.99 -----------------------------(2)  Suitable stage marks can also be given for using binomial distribution with p=0.02 &q=0.98 | | |  |
|  | b) | = k  f (x) = k-------------------(2)  since f(x) is a density fun  k=1/2 -----------------------------------(3)  mean= ---------(2)  Var X=3 -------------------(1) | | | 2 |
| 3 | a) | --------------(2)  α=3 ----------------------------------(3)  P(IXI<1)=P(IXI>1)  α=2 ------------------------(2) | | |  |
|  | b) | P(X<5)=0.05 -------------(1)  P(5<X<25)=0.25-----------(1)  = 1.65----------(2)  = 0.53------(2)  μ=34.47 --------------(1)  17.86 --------------(1) | | |  |
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| **PART B** (**MODULES III AND IV**) | | | | | |
| ***Answer two full questions*.** | | | | | |
| 4 | a) | F[f(x)]=-------(1)  = -------(1)  =----------(2)  f (x) =--------(1)  1-IxI=-------(2) | | |  |
|  | b) | f (x)=--------(2)  =d---------------(3)  d------------(3) | | |  |
| 5 | a) | Fs[f(x)]=-------(1)  =-------------------------(2)  f(x)=-------(1)  e-x =----------(2)  =-----------(1) | | |  |
|  | b) | (i) L[e-tsint]=------(2)  L[te-tsint]=-----(1)  =-------(1)  (ii)L[] = -----(1)  = - ----(1)  =log------------(2) | | |  |
| 6 | a) | L[(D2-4D+5)y] = 4L[e3t]------(1)  L(y)-sy(0)-(0)-4[L(y)-y(0)]+5L(y)=----(2)  L(y)=------------------(2)  y=2 e3t+ e2tsint---------------------(2) | | |  |
|  | b) | = ------(1)  =cosat \*-------------------(2)  = ----(2)  = -------------------(3) | | |  |
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| **PART C** (**MODULES V AND VI**) | | | | | |
| ***Answer two full questions*.** | | | | | |
| 7 | a) | = - -----(1)  Root lies bet 0 & 1----(1)  =0.6667--------(2),=0.730159 --------(2),=0.73205 --------(2),  =0.73204 --------(1), Ans-0.7320------(1) | | |  |
|  | b) | Table------------(3)  =1941, p=0.5 --------(1),  Formulae------(1)  y= 21.69-------------(2)  =1981, p= -0.5 --------(1),  Backward formulae-------(1)  y= 40.56---------------(2)  increase=18.87------(1) | | |  |
|  |  |  | | |  |
| 8 | a) | formulae----(2)  Substitution-----(2)  Ans= 37.2307-----(3) | | |  |
|  | b) | Augment matrix------(1)  Row reduction –(3)  z = 5----(1), y = -9 ---(1), x = 7 ---(1) | | |  |
|  | c) | x =(14-2y-z),y=(10-x+z),z=(20-x-y)------(1)  first iteration x=3.5,y=1.3,z=1.9-----------(2)  second iteration x=2.375,y=1.905,z=1.965-----------(1)  third iteration x=2.056,y=1.982,z=1.995-----------(1)  fourth iteration x=2.010,y=1.997,z=1.999-----------(1) | | |  |
| 9 | a) | V=-------(1)   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 0.0 | 0.25 | 0.5 | 0.75 | 1 | | y | 1 | .9896 | .9589 | .9089 | .8415 | | y2 | 1 | .979308 | .919489 | .826099 | .708122 |   =0.89474---(2)  Volume= \*0.89474 =2.81204----(1) | | | (3) |
|  | b) | =-----(2)  =1+0.2(0+1) =1.2-----(2)  =1.48-----------------(2) | | |  |
|  | c) | =0.2,=0.205,=0.20525,=0.21525,-----(2)  =0.21517-----------(1)  =2.20517------------(1)  =0.2105,=0.21604,=0.2163,=0.22214,-----(2)  =0.21622-----------(1)  =2.42139 | | |  |