Meeh (Sem-IK)

Mech

Course Code: PEC401 Time: 2 hour 30 minutes Course Name : Engineering Mathematics-4 Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions ar
	compulsory and carry equal marks
1.	Find the angle between the normals to the surface $xy = z^2$ at the
	points (1,4,2) and (-3,-3,3).
Option A:	$sec^{-1}(\frac{1}{\sqrt{22}})$
Option B:	$\cos^{-1}(\frac{1}{\sqrt{22}})$
Option C:	$sec^{-1}(\frac{1}{\sqrt{2}})$
Option D:	$\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$
2.	Using Stoke's theorem, $\int_C \overline{F} \cdot d\overline{r}$ where $\overline{F} = yzi + xzj + xyk$ and C
	is the boundary of the circle $x^2 + y^2 + z^2 = 1, z = 0$ is
	is the boundary of the circle $x + y + 2 - 1, z = 0$ is
Option A:	-13
Option B:	33
Option C:	13
Option D:	0
3.	If correlation coefficient, $r = 0.6$ then $b_{yx} = 1.2$ then $b_{xy}=?$
Option A:	0.45
Option B:	0.2
Option C:	0.72
Option D:	0.3
4.	If two variables oppose each other then the correlation will be
Option A:	Positive correlation
Option B:	Negative correlation
Option C:	Perfect correlation
Option D:	No correlation
Specific.	
5.	In a Poisson distribution if $P(X = 2) = P(X = 3)$ then $P(X = 5)$ is
영영문가지?	
Option A:	0.84125

1 | Page

Option C:	0.37256
Option D:	0.037256
6.	For a probability density function of a continuous random variable
	the probability of a single point is
Option A:	1
Option B:	2
Option C:	0
Option D:	constant
7.	Which of the following tests would be used to test the mean of a
	continuous random variable to a population mean?
Option A:	One-sample <i>t</i> -test
Option B:	Independent-samples <i>t</i> -test
Option C:	Chi-squared <i>t</i> -test
Option D:	Dependent-samples <i>t</i> -test
8.	Which of the following is not true for a normal distribution?
Option A:	It is a symmetrical distribution.
Option B:	The mean is always zero.
Option C:	The mean, median, mode are always equal.
Option D:	It is a bell-shaped distribution.
57.5 NOR	
9.	The value of $\int_c \frac{\sin z dz}{z^5}$, where c is the circle $ z = 1$ is
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Option A:	271
Option B:	25 ni
A CAR	$\overline{\overline{60}}$
Option C:	3πί
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Option D:	<u>-20</u> 5πi
option D:	<u></u>
<u>688886</u> 189887	12
10.	The value of integral $\oint_c \frac{1}{z-1} dz$, where c is $ z-1 = 2$ is
Option A:	0
Option B:	1
Option C:	-2πi
Option D:	2πι

<u>Q2</u>	Solve any Four out of Six	5 marks each
Α	Obtain Laurent's expansion of f	$(z) = \frac{z-1}{z^2-2z-3}$ in (i) $1 < z < 3$ (ii)

2 | Page

and the second	z > 3		and the second
В			re recorded for 11 students. Find
	Spearman's rank	correlation coeffici	ent between the ranks obtained.
•	Pre-module	Post-module	그는 이 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷 옷
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	21	25	전문 아님 것 같은 것 전문 영문
	16	17	<u>에</u> 알려 안 한 것 같아요. 가지 않는 것 같아.
	22	24	프랑 한 동일에서 한 것이 이상 문화
	19	16	그는 그는 것을 같은 것을 가셨다.
	24	29	
	17	20	<u> 그</u> 같은 것 같은
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	23	19	비행하는 것 같은 것이 가지 않는
	18	20	그 다양 아이지 않는 것 같아.
Stan Maria	14	15	
С	balls. He is offer	ed Rs. 7, Rs. 5, Rs. 1	ontaining 7 blue, 5 yellow, 3 purpl 3 if he draws 3 balls of same of each colour respectively. Find
	his expectation.		
D	A brochure invit	ing subscriptions for	a new diet program states that the
	participants, the		f the five-week weight losses of 2 mple standard deviation are found
		No. 1. N. NEW WWW WITH N.N. FUEL N. B. DU.	uld the statement in the brochure ngs? Test at the $\alpha = 0.05$ level of
E	be substantiated significance. Evaluate using	based on these findi Green's theorem \int_c igion bounded by $y =$	uld the statement in the brochure ngs? Test at the $\alpha = 0.05$ level of $(x^2ydx + y^3dy)$ where c is the
E	be substantiated significance. Evaluate using boundary of the re to (0,0) traversed Show that the	based on these findi Green's theorem \int_c egion bounded by $y =$ in positive sense	uld the statement in the brochure ngs? Test at the $\alpha = 0.05$ level of $(x^2ydx + y^3dy)$ where c is the x^2 and $y = x$ from (0,0) to (1,1) the $yz)i + (y^2 - xz)j + (z^2 - xy)k$ is
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F	be substantiated significance. Evaluate using boundary of the re- to (0,0) traversed Show that the irrotational and he Solve any Four The IQs of indiv retarded are appr a standard deviat (a) What is the	based on these findi Green's theorem \int_c gion bounded by $y =$ in positive sense vector, $\overline{F} = (x^2 -$ ince, find \emptyset such that \overline{D} out of Six iduals admitted to a roximately normally ion of 10. probability that an	uld the statement in the brochure ngs? Test at the $\alpha = 0.05$ level of $(x^2ydx + y^3dy)$ where c is the x^2 and $y = x$ from (0,0) to (1,1) the $yz)i + (y^2 - xz)j + (z^2 - xy)k$ is
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E Q3 A	 be substantiated significance. Evaluate using boundary of the reto (0,0) traversed is Show that the irrotational and he Solve any Four The IQs of indiversed are appreared are appreared as standard deviate (a) What is the have an IQ between individuals? If the mean age a years with standard confidence limits Also determine or standard determine o	based on these findi Green's theorem \int_c gion bounded by $y =$ in positive sense vector, $\overline{F} = (x^2 - x^2 - x^2)$ ince, find \emptyset such that \overline{A} out of Six iduals admitted to a roximately normally ion of 10. probability that an veen 55 and 75? (b) at death of 64 men en- ard deviation of 10.2 s for the mean age of	uld the statement in the brochure ngs? Test at the $\alpha = 0.05$ level of $(x^2ydx + y^3dy)$ where <i>c</i> is th x^2 and $y = x$ from (0,0) to (1,1) the $yz)i + (y^2 - xz)j + (z^2 - xy)k$ if $\overline{F} = \nabla \emptyset$. 5 marks each state school for the mentally distributed with a mean of 60 and individual picked at random will what is the lowest IQ of top 30% engaged in an occupation is 52.4 years, what are the 98% f all men in that population? the at 5% level of significance that
E Q3 A	be substantiated significance.Evaluate using boundary of the re- to $(0,0)$ traversed.Show that the irrotational and heSolve any FourThe IQs of indiv retarded are appr a standard deviat (a) What is the have an IQ betwee individuals?If the mean age a years with standard confidence limits Also determine of that mean age of If the directional of $i + j - j$	based on these findi Green's theorem \int_c gion bounded by $y =$ in positive sense vector, $\overline{F} = (x^2 - x^2 - x^2)$ ince, find \emptyset such that \overline{A} out of Six iduals admitted to a roximately normally ion of 10. probability that an veen 55 and 75? (b) at death of 64 men et ard deviation of 10.2 s for the mean age of can it be safely assum death of population lerivative of $\emptyset = ax^2 - x^2 - x^2$ + k , find a and b.	uld the statement in the brochure ngs? Test at the $\alpha = 0.05$ level of $(x^2ydx + y^3dy)$ where <i>c</i> is th x^2 and $y = x$ from (0,0) to (1,1) the $yz)i + (y^2 - xz)j + (z^2 - xy)k$ if $\overline{F} = \nabla \emptyset$. 5 marks each state school for the mentally distributed with a mean of 60 and individual picked at random will what is the lowest IQ of top 30% engaged in an occupation is 52.4 years, what are the 98% f all men in that population? the at 5% level of significance that

3 | Page

E	Use Sto	kes' the	orem to	evalua	ate ſ	\overline{F} . \overline{dr}	where	$\overline{F} = (x)$	$2 - y^2$	(i + 2)	rvi an
	c is the	boundar	vofreg	ion bo	unded	hv v =	0 r	- 2 11 -	-r int	horn	nlono
F	For giv	ven the	table of	noint	s	<u> </u>	· 0, x	<u> </u>	<u>– x m t</u>	<u>iie xy</u>	plane.
	X	0	2	4	6	5	3	12	20		
	Y	10	12	18	22		0	30	30		
				1		Tables	No. of March 1.	0 1 A 1 A		ată ân	d find
		Use normal equations, fit the straight line $y = ax + b$ to the data and find the value of $y(22)$.									
Q4		Solve any Four out of Six 5 marks each									
A	In a stu				ess of	an inse	ectici	le agai			
	a large	area of	land w	as sni	aved	Later	the a	ea was	evam	ined f	for liv
	insects	hy rand	omly s	alacti	ng gai		nd aa	Ca was	the mu		
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	insects	per squ		isi caj			SHOW		average	e nun	iber o
	incoute	live insects per square after spraying to be 0.5. If the number of live									
		insects per square follows a Poisson distribution, find the probability									
		that a selected square will contain:									
	 Interpretation and the second sec second second sec	(a) One or more live insects									
	(\mathbf{D}) I WC	(b) Two live insects									
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В		On an average 20% of population in an area, suffer from T.B. What is									
	the prot	the probability that out of 6 persons chosen at random from this area (a)									
	at least	at least 2, (b) none suffer from T.B.?									
						<u></u>			494		, 14 mm , 3
	Evaluat	Evaluate $\int_c \vec{F} \cdot d\vec{r}$ where $\vec{F} = yzi + (xz + 1)j + xyk$ along the line									
	joining	joining A (1,0,0) to B (2,1,4).									
С		SAN.		1.66							
	and the second	<u> </u>	fimiros	chou	, the	distrib	ition	of the	digita	in m	1.
in the second	The fol	lowing.					nuon	or me	urgits	III DU	inders
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the second se	chosen whether	at rando the di	om cho	sen fr	om a	telepho	one di	rectory	r. Test freque	at 5%	in the
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D	chosen whether director Digits Frequ. Show the	at rando the di y. 0 1026 at $\overline{F} = (y)$ poth irro	om cho gits ma 1 107 $2 - z^2$ tational	sen fr ay be 2 997 + 3yz and so	om a taken 3 966 -2x) olenoid	telepho to oc $\frac{4}{1075}$ i + (3x) al.	$\begin{array}{c} \text{one diagonal} \\ \text{cur e} \\ \hline 5 \\ 933 \\ \hline z + 2 \end{array}$	rectory equally 6 1107 xy)j +	freque 7 972 (3 <i>xy</i> –	8 964 - 2 <i>xz</i> -	in the 9 853