

AIKTC/KRRC/SoET/ACKN/QUES/2017-18/

Date: _____

School: SoET-CBCS Branch: ELECT. ENGG. SEM: III

To,
Exam Controller,
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following [✓]Semester/Unit Test-I/Unit Test-II (Reg./ATKT) [✓]question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Applied Mathematics- III	EEC301		✓	
2	Electronic Devices & Circuits	EEC302		✓	
3	Conventional And Non-Conventional Power Generation	EEC303			
4	Electrical and Electronics Measurement	EEC304		✓	
5	Electrical Machine – I	EEC305		✓	

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC



AITC
KALSEKAR TECHNICAL CAMPUS
INNOVATIVE TEACHING. EXPERIENTIAL LEARNING.

Knowledge Resource & Relay Centre (KRRRC)

School of Pharmacy

School of Engineering & Technology

School of Architecture

AIKTC/KRRRC/SoET/AACKN/QUES/2017-18/

Date: _____

SEM: VI

Branch: CIVIL ENGG.

School: SoET-CBCS

AIKTC, New Panvel.

Exam Controller,

To,

Dear Sir/Madam,

Received with thanks the following Semester/Unit Test-I/Unit Test-II (Reg./ATKT) question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format			No. of Copies
			SC	HC	VI	
1	Geotechnical Engg-II	CE-C601				
2	Design & Drawing Of Steel Structure	CE-C602				
3	Transportation Engg. - II	CE-C603				
4	Environmental Engg - II	CE-C604				
5	Water Resource Engineering-I	CE-C605				
6	Department Level II-Optional Course	CE-C606				
7	Software Applications in Civil Engineering					

Note: SC - Softcopy, HC - Hardcopy

(Shabheen Ansari)
Librarian, AIKTC

40

SF - sem-10 - Choice Based - Electrical - AM-III

8/5/18

Q.P. Code: 24962

Duration: 3 Hours

Max. Marks: 80

- Note: 1. Questions No. 1 is compulsory.
 2. Attempt any 3 Questions from the remaining questions.
 3. Figures to the right indicate carries full marks.

- Que. 1 a. Find Laplace transform of $e^{-t}t \cos 2t \cdot \sin 4t$ 5
 b. Find Fourier expansion for $f(x) = |x|$ in $(-\pi, \pi)$ 5
 c. Prove that $\vec{F} = \frac{\vec{r}}{r^3}$ is solenoidal. 5
 d. If $f(z) = (r^2 \cos 2\theta + ir^2 \sin p\theta)$ is analytic find p. 5

- Que. 2 a. Prove that $u = e^{2x} \cos 2y$ is harmonic function, hence find its corresponding harmonic conjugate orthogonal 6
 b. By using convolution theorem, find the inverse Laplace Transform of $\frac{s}{(s^2+4)(s^2+9)}$ 6
 c. Find Fourier series for $f(x) = x \sin x$ in $(0, 2\pi)$ 8

- Que. 3 a. Prove that a vector field \vec{F} is given by $\vec{F} = (y \sin z - \sin x)i + (x \sin z + 2yz)j + (xy \cos z + y^2)k$ is irrotational, hence find its scalar potential. 6
 b. Find analytic function $f(z)$, whose real part is $u = \frac{\sin 2x}{\cosh 2y + \cos 2x}$ 6
 c. By using Laplace transform, solve $y'' + 2y' + 5y = e^{-t} \sin t$; $y(0)=0, y'(0)=1$ 8

- Que. 4 a. Prove that $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x$ 6
 b. Evaluate $\int_C \vec{F} \cdot d\vec{r}$ where $\vec{F} = (2x - y)i - yz^2j - y^2zk$, where C is the boundary of the surface of hemisphere $x^2 + y^2 + z^2 = a^2$ lying above the xy-plane. 6
 c. Find inverse Laplace Transform of i. $\frac{(s+1)e^{-\pi s}}{s^2+2s+5}$ ii. $\frac{1}{s} \log \left(\frac{s+2}{s+1} \right)$ 8

Q.P. Code: 24962

Que 5 a. Show that the functions $\{ \sin x, \sin 3x, \sin 5x, \dots \}$ are orthogonal in $[0, \frac{\pi}{2}]$ and find the corresponding set of orthonormal functions. 6

b. Show that under the transformation $w = \frac{1}{z}$ the circle $(x-3)^2 + y^2 = 2$ the circle is mapped to the circle $(u-\frac{3}{7})^2 + v^2 = \frac{2}{49}$ 6

c. Verify Green's Theorem in the plane for $\oint (x^2 - y)dx + (2y^2 + x)dy$ around the boundary of the region defined by $y = x^2$ and $y = x$. 8

Que 6 a. By using Laplace transform, evaluate $\int_0^{\infty} e^{-t} \frac{\sin^2 t}{t} dt$ 6

b. Find a bilinear transformation which maps $z=1, i, -1$ into $w=0, i, -\infty$ and hence find the fixed points 6

c. Find the Fourier integral representation of $f(x) = \begin{cases} e^{ax}, & x \leq 0 \\ e^{-ax}, & x \geq 0 \end{cases}$ 8

and hence S.T. $\int_0^{\infty} \frac{\cos \lambda x}{\lambda^2 + a^2} d\lambda = \frac{\pi}{2a} e^{-ax}; x > 0, a > 0$

2

SE - Sem - II - Choice Based - Electrical - EDC
Q.P.Code: 38449

16/5/11

(3 Hours)

[Total Marks:80]

- N.B.** (1) Question no.1 is compulsory.
(2) Attempt any three from the rest.
(3) Make any suitable assumption wherever required.
- Q.1** Answer any four.
- | | | |
|-----|--|----|
| (a) | Explain drift current and diffusion current | 5M |
| (b) | Explain DC load line in common emitter BJT | 5M |
| (c) | Explain why FET is free from thermal runaway. | 5M |
| (d) | Explain the re model of BJT. | 5M |
| (e) | Explain the sufficient and necessary conditions for the oscillation. | 5M |
- Q.2** (a) Explain the input and output characteristics of CE BJT amplifier. 10M
(b) Explain different biasing techniques in BJT 10M
- Q.3** (a) Write the working principle of enhancement and depletion type of MOSFET. 10M
(b) Draw the circuit diagram of bridge rectifier with LC filter with all the waveforms and derive the expression for ripple factor. 10M
- Q.4** (a) Draw the circuit diagram of current series feedback amplifier and derive the expression for input and output impedance and voltage gain with feedback. 10M
(b) Explain the working principle of the following semiconductor devices 10M
- i. PIN diode
 - ii. FET
 - iii. L-C tank circuit
 - iv. Schottky diode
- Q.5** (a) Draw the circuit diagram of collpitt's oscillator and explain the working. Derive the expression for the frequency of oscillation. 10M
(b) explain the modeling of CE BJT in h- parameter and hence derive the expression for voltage gain 10M
- Q.6** Write short note on any THREE of the following. 20M
- (a) UJT relaxation oscillator.
 - (b) Zener diode as voltage regulator
 - (c) Two port network
 - (d) Input output and transfer characteristics of FET

3

SF-sem-III - Choice Based - Electrical - EEM
QP CODE : 37841

2/6/18

(3 Hours)

Total Marks : 80

N.B: (1) Question No 1 is compulsory.

(2) Attempt any three out of the remaining.

(3) Assume suitable data, if necessary.

1. (a) Discuss various types of errors. How these errors are minimized ? (10)
(b) Write short on resolution and sensitivity of digital meters. (10)
2. (a) Explain why Wheatstone Bridge is not used for measuring low value of resistance. (10)
(b) Compare the controlling torque of spring force and gravitational force (10)
3. (a) Explain the working principle of piezoelectric transducers. (10)
(b) Explain accuracy, precision, sensitivity and resolution. (10)
4. (a) Explain with the diagram RTD. (10)
(b) Draw the circuit diagram of De-Sauty bridge and explain (10)
5. (a) Draw the circuit diagram of Digital Frequency meter and explain. (10)
(b) Draw the multiplier circuit for voltmeter and explain. (10)
6. Write short notes on the following (any two) (20)
 - (a) PMMC
 - (b) Weston type Synchroscope.
 - (c) Integrating Instruments.

16

SE - sem-III - Choice Based - Electrical - EMI-I

1/6/11

Q. P. Code : 21836

(3 Hours)

(Total Marks : 80)

Please check whether you have the right question paper.

- N.B.:
- 1) Questions No.1 is compulsory.
 - 2) Attempt any three from the remaining Questions No.2 to No.6.
 - 3) Illustrate answer with diagrams wherever necessary.

1. Attempt any four : (20)
 - a) Explain eddy current loss & various factors affecting it.
 - b) Explain significance of commutator and brushes in DC machine?
 - c) Explain necessity of starter in DC Motor
 - d) Write a difference between electric circuit and magnetic circuit.
2.
 - a) Explain the principle of energy conversion & develop the model of an electromechanical energy conversion device. (10)
 - b) An iron ring of mean length 60 cm has air gap of 1 mm and a winding of 200 turns. If a relative permeability of iron is 300, find the flux density when a current of 1 Amp flows through the coil. (10)
3.
 - a) Write a short note on Doubly excited magnetic field. (10)
 - b) Explain different electrical braking methods for separately excited DC Motor. (10)
4.
 - a) Explain the effect of armature reaction on working of DC machines and methods to minimize it? (10)
 - b) 120V dc shunt motor having armature & field winding resistances as 0.2Ω and 60Ω draws a line current of 40A at full load. The brush voltage drop is 3V and rated full load speed is 1800 rpm. Calculate speed at half the full load. (10)
5.
 - a) Draw and explain speed-torque, torque-armature current and speed -armature current characteristics of DC series motor. Also write applications. (10)
 - b) A DC machine is tested for Swinburne's test. The machine is rated for 230V, 50 Amp. The observations during test were as follows :
No load current = 5Amp, Armature resistance = 1Ω , Shunt field resistance = 200Ω .
Find full load efficiency if the machine was tested as DC Motor. (10)
6.
 - a) Explain Hopkinson's Test with neat diagram. (10)
 - b) What are the different types of Stepper Motor? Explain anyone type with neat diagram. (10)