

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, JUNE-2018**Subject: Digital ElectronicsBranch: **EEE**

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Convert the following number in decimal i) $(1011.11101)_2$ ii) $(FACE17)_{16}$.
2. Obtain the canonical sum of products of the function $Y = AB + ACD$
3. With an example explain what is a combinational circuit?
4. Convert D flip-flop into SR flip-flop.
5. What are the Moore and Mealy machines? Compare them.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. Determine the single error correcting code for the BCD number 1001(information bits) using even parity and odd parity. [10]
2. Simplify the Boolean function $f(A,B,C,D)=\sum m(0,2,3,6,7,8,10,12,13)$ by using Quine-Mc Clusky method? [10]
3. a) Design a BCD to Excess-3 code converter? [5]
b) Design a 4 to 2 priority Encoder circuit. [5]
4. a) Write short note on i) Ring counter ii) Shift counter [5]
b) Design a 3-bit down counter using J-K flip-flop [5]
5. Explain the procedure of state minimization using the merger graph and merger table. [10]
6. a) Perform the following additions in excess-3 code [5]
i) $37+28$ ii) $247.6+359.4$
b) What is a Gray code? And write the applications. [5]
7. Implement the following two Boolean functions with a AND gate [10]
 $f_1(A, B, C) = \sum m(0,1,2,4)$
 $f_2(A, B, C) = \sum m(0,5,6,7)$
8. a) Explain the terms: PLA, PAL and PROM. [5]
b) Implement full adder using 4*1 multiplexer. [5]

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018Subject: Electronic Devices and Circuits

Branch: EEE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. How a Depletion region is formed?
2. Explain the principle and working of photo diode and list its applications
3. Write different types of Transistor Amplifier Configurations
4. What are different features of FET?
5. Write the condition for Thermal Stability.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Define diffusion Capacitance C_D ?
b) Obtain expression for Transition Capacitance C_T .
2. a) Explain various current components in a forward bias PN Junction
b) Explain break down mechanisms in semiconductor diodes.
3. Explain working of Bridge Rectifier with necessary sketches and find out V_{DC} , I_{DC} , efficiency and PIV.
4. Derive the expression for ripple factor of L- filter.
5. a) Explain different limits of operation of BJT.
b) In a Common Base connection the Emitter Current I_E is 6.28 mA and collector current I_C is 6.20 mA. Determine Common Base Current gain?
6. a) Draw and explain the input and output characteristics of CE Configuration
b) Explain why BJT is called as current controlled device.
7. a) Give constructional details of JFET.
b) Explain operation of C-filter with neat sketches for Half wave rectifier
8. Explain different types of compensation techniques with neat sketches?

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018Subject: Fluid Mechanics and Hydraulic Machines

Branch: EEE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Define cavitation.
2. Stream line, streak line and path line are identical in steady flows, Explain?
3. What do you mean by boundary layer separation?
4. Define mechanical efficiency of a turbine.
5. Explain Reciprocating Pump.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Explain draft tube construction and working.
b) Write short notes on Differential U-tube manometer
2. a) What is vapor pressure? Explain the influence of vapour pressure in the fluid motion?
b) A Venturimeter with inlet and throat diameters 300 mm and 150 mm respectively is attached in a vertical pipe in which flow occurs from bottom to top. The distance between the point of entrance and to the point of throat of the Venturimeter is 750 mm. If the difference of mercury level in the two limbs of differential gauge is 220 mm, find the discharge passing through the vertical pipe. Take co-efficient of discharge = 0.98.
3. a) Explain drag and lift for submerged bodies.
b) Explain hydraulic gradient line and total energy line.
4. a) Write short notes on Governing of turbines.
b) Derive an expression for the force exerted by a jet on curved plate.
5. a) A single acting reciprocating pump has a plunger of diameter 300 mm and a stroke of 400 mm. Determine the coefficient of discharge and percentage of slip of pump when it delivers a discharge of 25 lps of water under a total head of 32 m and rotating at a speed of 75 rpm.
b) A Kaplan turbine delivers 30 MW and runs at 175 rpm. Overall efficiency is 85% and hydraulic efficiency is 91%. The tip diameter 5 m and the hub diameter is 2 m. Determine the head and the blade angles at the mid radius. The flow rate is $140 \text{ m}^3/\text{s}$.
6. a) Find the power required to tow lengthwise a plate 1.2m wide and 3m long at a velocity of 2.4 m/s in water at 23°C . make allowance for the fact that the boundary layer will change from laminar to turbulence over the plate, ν for water at 23°C is $0.9 \times 10^{-6} \text{ m}^2/\text{s}$ and $\rho = 1000 \text{ kg/m}^3$.
b) Define capillarity? And explain with neat sketch for different fluid

7. a) In a 100 mm diameter horizontal pipe, a venturi meter of 0.5 contraction ratio has been fixed. The head of water on the meter when there is no flow is 3 m (gauge). Find the rate of flow for which the throat pressure will be 2 meters of water absolute. The co-efficient of the meter is 0.97. Take atmospheric pressure head = 10.3 m of water.
- b) A U-tube differential gage is attached to two sections A and B in a horizontal pipe in which oil of specific gravity 0.8 is flowing. The deflection of the mercury in the gauge is 60cm, the level near to A being the lower one. Calculate the difference of pressure in Kg(f)/cm^2 between the sections A and B.
8. a) A pipe 300 m long has a slope of 1 in 100 and tapers from 1.2 m diameter at the high end to 0.6 m diameter at the low end. Quantity of water flowing is 5400 liters per minutes. If the pressure at the high end is 68.67 kPa [0.7 kg(f)/cm^2], find the pressure at the low end. Neglect losses.
- b) Derive an expression for force exerted by a jet on inclined moving plate.

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, JUNE-2018Subject: Electro Magnetic FieldsBranch: **EEE**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2Mark=10 Marks**

1. Name the various coordinate systems.
2. Define Ohm's law in point form.
3. Find the magnetic field intensity at a point P (0.01, 0, 0) m, if the current through conductor is 6A, which is along the z-axis and $a = 3$ mm, $b = 9$ mm, $c = 11$ mm.
4. Give the relationship of force acting on a moving charge in electric and magnetic fields.
5. Find the inductance of an Ideal solenoid with 300 turns, $\ell = 0.50$ m and a circular cross section of radius 0.02m ?

PART-BAnswer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

1. a) A charge of 10 nC is at rest in free space. Find the electric potential at a point, A which is 10 cm away from the given charge. [4]
b) State and explain Gauss law. Also mention its applications. [6]
2. a) Write short notes on Characteristics of permanent magnets.
b) Two point charges 1.5 nC at (0, 0, 0.1) and -1.5 nC at (0, 0, -0.1) are in free space. Treat the two charges as a dipole at origin and find the potential at (0.3, 0, 0.4).
3. a) What is a magnetic dipole? How does a magnetic dipole differ from an electric dipole?
b) Describe the Biot-Savart's law with an application.
4. a) Two long parallel conductors carry 80A. If the conductors are separated by 30mm. Find the force per metre of each conductor if the current flows in opposite direction.
b) Determine the Force between two straight long and parallel current carrying conductors.
5. a) Obtain the expressions for scalar and vector magnetic potential. [4]
b) List Out the limitations of Scalar Magnetic Potentials. [3]
c) Derive the expression for inductance of a solenoid. [3]
6. a) Derive the Maxwell's I equation for static electric fields.
b) Determine the solution of Laplace's equation (one variable form) in spherical coordinates. Using the equation, determine the potential function $V=0$ for $r=0.1$ and $V=100$ for $r=2$ m.
7. a) Derive the boundary conditions at an interface between two Medias.
b) Derive the expression for capacitance of parallel plate capacitors with composite dielectrics.
8. a) Derive the expression for magnetic field intensity due to an infinite sheet of long current carrying conductor.
b) Define the following
i) Magnetic permeability ii) Intensity of magnetization

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018**Subject: Elementary Calculus and Transforms

Branch: CE, ME, EEE & ECE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Define Fourier series of function $f(x)$ defined on $-L \leq x \leq L$
2. State the Convolution theorem for Z transforms.
3. Evaluate $\int_0^2 \int_0^x xy \, dy \, dx$.
4. Expand e^x by Maclaurin's series
5. Write down the expression of : $\text{div} (\text{grad} (f))$, where $f(x,y,z)$ is a scalar function.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. Find the Fourier for the function $f(x) = \begin{cases} 0, & -2 < t < -1 \\ 1+t, & -1 < t < 0 \\ 1-t, & 0 < t < 1 \\ 0, & 1 < t < 2 \end{cases}$

2. a) If $Z[n^2] = \frac{z^2 + z}{(z-1)^3}$. Find $Z[n^3]$ and $Z[n^4]$

b) Form the partial differential equation by eliminating arbitrary functions from

$$u = f(x^2 + 2yz, y^2 + 2zx)$$

3. Using triple integration find the volume of the sphere $x^2 + y^2 + z^2 = a^2$.
4. Show that $f(x) = x^3 + y^3 - 63(x+y) + 12xy$ is maximum at $(-7, -7)$ and minimum at $(3, 3)$
5. Verify Gauss Divergence theorem for $\vec{F} = 4xz \hat{i} - y^2 \hat{j} + yz \hat{k}$, taken over the cube bounded by $x=0, x=1, y=0, y=1, z=0$ and $z=1$.
6. Find the Fourier series to represent $f(x) = x^2 - 2$, when $-2 \leq x \leq 2$.
7. a) Find the inverse Z – transform of $\frac{2z^2 + 3z}{(z+2)(z-4)}$
- b) If $F(z) = \frac{5z^2 + 3z + 12}{(z-1)^4}$ find the values of $f(2)$ and $f(3)$.
8. Graph the curve $r^2 = 4 \sin(\theta)$ in polar coordinates

