Code No.: **70353** | **MR17**

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-2019

Subject: **Mechanical Technology**
Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Draw the displacement diagram for uniform velocity follower motion.
2. Write about the type of belt drives.
3. Define interference in gear wheels
4. If the speed of a 4stroke engine is 1200rpm, the same is converted to 2stroke engine find the engine speed.
5. What do you understand by cooling of air in Air compressors? Why it is necessary?

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. A cam is to be designed for a knife edge follower with the following data
   i) Cam lift=40mm during 90^0 of cam rotation with SHM ii) dwell for the next 30^0
   iii) During the next 60^0 of cam rotation, the follower returns to its original position with SHM
   iv) Dwell during the remaining 180^0. Draw the profile of the cam when the line of stroke is offset 20mm from the axis of the cam shaft. The radius of the base circle of cam is 40mm

OR

2. Draw the profile of a cam operating a knife edge follower from the following data:
   i) Follower to move outward through 40mm during 60^0 of a cam rotation, ii) Follower to dwell for the next 45^0 iii) Follower to return its original position during next 90^0 iv) Follower to dwell for the rest of the cam rotation. The displacement of the follower is to take place with SHM during both outward & return strokes. The least radius of the cam is 50mm. If the rotates at 300rpm, determine the maximum velocity & acceleration of the follower during the outward stroke & return stroke.
3. a) Find the power transmitted by a belt running over a pulley of 600mm diameter at 200 r.p.m. The coefficient of friction between the belt and the pulley is 0.25, angle of lap 160° and maximum tension in the belt is 2500 N.
   b) Discuss briefly the various types of belts used for the transmission of power

OR

4. a) What is centrifugal tension in a belt? How does it affect the power transmitted?
   b) A pulley is driven by a flat belt, the angle of lap being 120°. The belt is 100mm wide by 6mm thick & density1000kg/m3. If the coefficient of friction is 0.3 & the maximum stress in the belt is not to exceed 2MPa, find the maximum power which the belt can transmit and the corresponding speed of the belt.
5. a) Each of 2gears in a mesh has 48teeth & a module of 8mm. The teeth are of 20°involute profile. The arc of contact is 2.25times circular pitch, determine the addendum.
   b) What is Law of gearing?

OR

6. a) Define i) Velocity of sliding of teeth ii) List the forms of teeth
   b) Classify the Drilling Machines and Draw any one and name all the parts.
7. a) Draw a neat diagram of an IC engine and name the different parts.
   b) With neat figures explain the working of 4 stroke SI engine.

OR

8. a) Write the applications of IC engines in field of engineering.
   b) Explain the working four stroke spark ignition engines with neat sketch.
9. a) Explain in detail about Air compressor with clearance volume.
   b) Explain, with neat sketch the working of an axial flow compressor

OR

10. a) Differentiate between centrifugal compressor and axial flow compressor
    b) What is the difference between rotary and reciprocating compressor

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II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Mining Geology**

Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Describe Mohs' scale of Hardness?
2. What is magma?
3. Write down mechanism of fault.
4. What are tenor and grade?
5. Define mineral reserve.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. Describe the physical properties, chemical composition and uses of the following minerals:
   a) Calcite b) Albite c) Corundum d) Hematite e) Pyrite

OR

2. Discuss the development of land forms by oceans
3. What is metamorphic rock? Discuss the classification of metamorphic rock.

OR

4. What is sedimentary rock? Discuss the classification of sedimentary rock.
5. Bring out the differences among the following deformed rock structures with neat sketches:
   a) Box fold and Fan fold
   b) Open fold and Close fold
   c) Horst and Graben
   d) Release joints and Extension joints
   e) Angular Unconformity and Heterolithic Unconformity

OR

6. Define Isoclinal Fold? List out at least five types of folding.
7. Give an account of mineral resources of India with special reference to coal and petroleum

OR

8. Define ore deposit? Explain the controls of ore deposits with examples.
9. Discuss in detail the geologic method of mineral exploration? Illustrate your answer with different geologic criteria or guides.

OR

10. Describe the major geophysical prospecting methods and their applications in mineral exploration?

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MR17

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II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Introduction to Mining Engineering**

Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Define the terms (a) Gangue (b) Mineral deposite.
2. Draw a neat sketch of drop raise method of sinking
3. Define the terms (a) Cross cut (b) Adit
4. List the various types of roof bolting
5. List the advantages of TBM

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. Explain in detail difference between single core barrel and double core barrel.

OR

2. What are the stages of the life of a mine? Briefly explain the impact of mining on economic and environmental activities of any country.
3. a) List the necessary equipment required for sinking a shaft.
   b) List the factors to be consider for the selection of a shaft as a mode of entry.

OR

4. If there is a loose sand in superjacent ground, which method of shaft sinking to be adopted. Explain the same with neat sketch?
5. a) Explain types of SFL **[2]**
   b) a coal seam of 2M. Thickness is extracted by a long wall retreating panel with face length of 120M. Web depth of shearer is 0.6M. Average manpower in the long wall face in a shift is 20. The specific gravity of in-situ coal is 1.4. If the shearer markers 4 full-face cuts in 3shifts. The face OMS in tones is. **[8]**

OR

6. Briefly explain the followings:
   a. Calculation of OMS b. Location of incline and drifts
7. What is difference between temporary and permanent supports? Explain any one type of permanent support.

OR

8. Explain fore poling. Write a short note on strata monitoring plan as per CMR 2017.
9. What are different types of drill patterns used in tunneling (Conventional method)?

OR

10. Briefly describe various cutters used in tunnel boring machine & give the cutter head configuration.

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MR17

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II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Environmental Science**

Branch: **Common to CE, ME & MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. What is Ecology?
2. What is an aquifer? Give its types.
3. What is photochemical smog?
4. Define Global Warming.
5. What is 3-R approach? Give its importance.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) Explain forest ecosystem in detail.
   b) Explain pond ecosystem in detail.

OR

2. a) Give the classification of ecosystem.
   b) Define food web? Explain in detail with neat diagram.
3. a) What are the effects of ground water usage?
   b) What are the effects of over utilization of surface water?

OR

4. Explain why biodiversity is very important for the existence of the human race. What are the different restoration and conservation measures for the repair and revamping of biodiversity?
5. a) Write a short note on misuse of international water for dumping of hazardous waste.
   b) What are the control methods of soil pollution?

OR

6. a) Explain coastal pollution in detail.
   b) What are air quality standards? Explain.
7. Write a note on the following
   a) Kyoto protocol
   b) Montreal protocol.

OR

8. Explain the major causes and consequences of deforestation.
9. Write a short note on the following
   a) Nature is for man's needs and not for his greed
   b) Population explosion

OR

10. Give a short note on the following
    a) Sustainable cities and communities
    b) Environmental Education

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II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Fluid Mechanics and Hydraulic Machines**
Branch: **Common to ME, EEE & MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Define the terms Fluid and ideal fluid.
2. Write any four applications of bernouills equation.
3. Write an equation for the loss of head at the entrance of the pipe.
4. Explain water hammer.
5. Define slip and % slip.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) Define Centre of Buoyancy, Meta Center and Meta centric height.
   b) A pipe line which is 4m in diameter contains a gate valve. The pressure at the centre of the pipe is 19.6 N/cm^2. If the pipe is filled with oil of specific gravity 0.87, find the force exerted by the oil upon the gate and position of centre of pressure.

OR

2. a) Explain about piezometer with neat sketch.
   b)The space between 2 square flat parallel plates is filled with oil. Each side of the plate is60cm. The thickness of the oil film is12.5mm. The upper plate, which moves at2.5m/sec requires a force of 98.1N to maintain the speed. Determine the dynamic viscosity&kinematic viscosity of the oil if the specific gravity of the oil is 0.95.
3. State Bernoulli's theorem for steady flow of an incompressible fluid. Derive an expression for Bernoulli's theorem from first principle and state the assumptions made for derivation.

OR

4. a) Define the equation of continuity. Obtain the expression for continuity equation for a three dimensional flow.
   b) Distinguish between the rotational and irrotational flow. Give one example each.
5. a) What are the different energy losses in the pipes?
   b) A 150mm diameter pipe reduces in diameter abruptly to 100mm diameter. If the pipe carries water at 30liters per second, calculate the pressure loss across the contraction. Take the coefficient of contraction as 0.6.

OR

6. a) Derive an expression for head loss through pipes due to friction.
   b) A main pipe divides into two parallel pipes which again forms one pipe.The length and diameter of first parallel pipe are 2000m and 1m while the length and diameter of second parallel pipe are 2000m and 0.8m.Find the rate of flow in each parallel pipe if total flow is 3m^3/s.Take f=0.005.
7. a). Explain the working of Pelton wheel turbine with a neat sketch and derive the expression for work done by water on the runner of the Pelton wheel.
   b). Define the unit quantities related to turbines and derive the expressions for them

OR

8. Find an expression for the work done per second on a series of moving curved vanes by a jet of water striking at one of the tips of the vane.
9. a) Define specific speed of the centrifugal pump and derive the expression for it.
   b) Explain model testing of centrifugal pumps.

OR

10. a) Describe manometric efficiency, mechanical efficiency & overall efficiency of centrifugal pump.
    b) Find reasons for negative slip in a reciprocating pump? Explain with neat sketches the functions of air vessels in a reciprocating pump