**QUESTION BANK POWER ENGG**

**Q.1**Define i) Mean Effective Pressure

ii) Piston Speed

iii) Swept Volume

**Q.2** Draw Carnot cycle on P-V and T-S Diagram

**Q.3** State the need of supercharging in I.C. Engines

**Q.4** Compare S.I. and C.I. engines on the basis of

i) Basic cycle used

ii) Compression ratio

iii) Ignition method

**Q.5** State the function of catalytic converter, explain 3 way catalytic converter with a neat labeled sketch

**Q.6** With the help of simple sketch, explain construction and working of four stroke SI Engine.

**Q.7** A Carnot engine working between 377o C and 37o C produces 120 KJ of work.

Determine i) Engine Thermal Efficiency ii) Heat added in KJ

.

**Q.8**  A single cylinder engine running at 1800 rpm develops a torque of 8 Nm. The indicated power of engine is 1.8 KW . Find friction power and mechanical Efficiency.

**Q.9**  State the need for multi staging in Air compressor and also state the condition for maximum efficiency.

**Q.10** Explain the working of Ram Jet with a neat sketch.

**Q.11** Draw P-h and T-S diagram for super heating in vapor compression system.

**Q.12** State the methods of energy saving in Air compressor.

**Q.13** With a neat sketch explain the working of constant volume gas turbine.

**Q.14** Explain construction and working of Lobe type rotary air compressor with a neat sketch.

**Q.15** Define i) Ton of refrigeration ii ) Coefficient of Performance (COP)

iii) Specific humidity iv) Due point temperature.

**Q.16** Differentiate between vapor compression cycle and vapor absorption cycle. (any 4 points ).

**Q.17** Two stage air compressor works between 1 bar and 10 bar . Compressor inlet air temperature is 30 o C. Index of compression is 1.3. Neglecting clearance determine

i) Intermediate pressure ii) Work done on the compressor.

**Q.18** Define the following terms related to air compressor. i) Volumetric efficiency ii ) Free air Delivery.

**Q.19** Give the detail classification of Air compressors.

**Q.20** Draw actual valve timing diagram for 4- stroke petrol engine.

**Q.21**  State the purpose of Morse test in petrol engine testing. Write stepwise procedure for conducting Morse test.

**Q.22** Write any three pollutants in exhaust gases of petrol & diesel engine with their effects on environment.

**Q.23** Explain the construction & working of Screw compressor with a neat label sketch.

**Q.24** Draw the outline of psychometric chart and show all the properties of moist

air on it.(at least 06)

**Q.25** An I.C. Engine uses 5 kg of fuel per hour having calorific value of 42,500 KJ/kg.The brake power developed is 21 kW. The temperature rise of cooling water is 23 0 c, when the rate of flow is 11 kg/min. The temperature rise of exhaust gases

is 2600 c, when rate of flow of exhaust gases is 4.6kg/min. Specific heat of water

and exhaust gases are 4.187 kJ/kgo K and 1 kJ/kgo K respectively. Prepare heat

balance sheet on minute basis.

**Q.26** What is catalytic converter? Explain two way catalytic converter with neat sketch.

**Q.27**  Give four application of gas turbine.

**Q28**  List the pollutants in exhaust gases of I.C. engines and state their effects on the environment and human-being

**Q.29** What is scavenging in I.C. engine? State its types.

**Q.30** Describe types of Sensors along with their application.

**Q.31** Explain MPFI with neat diagram.

**Q.32** State the norms of Bharat stage III & IV.

**Q.33** What are the causes of detonation in I.C. engine.

**Q.34** Define the terms i) Indicated power ii) Mechanical efficiency

iii) Brake power iv) BSFC

**Q.34** State different methods for improving thermal efficiency of gas turbine and explain Regeneration method along with P-V & T-S diagram.

**Q.35**  List the additives of lubricant used in S.I. engine & states their advantages.

**Q.36** A two stage single acting reciprocating compressor takes in air at ratio of 0.3 m3/sec. Intake pressure & temperature 1 bar & 16 0c. The air is compressed to final pressure of 7 bar. Intermediate pressure is ideal and intercooling is perfect. Compression ratio is 1.25; Compressor runs at 600 rpm. Find

i) Intermediate pressure ii) Power required to drive the compressor.

**Q.37** Explain construction and working of Turbo propeller with a neat labeled diagram.

**Q.38**  a) Define 1) Dew point temp. , 2) Relative humidity, 3 ) WBT, 4 )Degree of saturation.

**Q.39** Write four uses of compressed air.

**Q.40** An engine working on Otto cycle has diameter of 150mm & stroke of 225mm. Clearance volume is 1.25 X10-3 m3. Find air standard efficiency.

**Q.41** Draw split air conditioner with a neat sketch & labelled it.

**Q.42** Differentiate between open cycle & closed cycle gas turbine.

**Q.43**  Explain Battery ignition system in SI Engine with a neat sketch.

**QUESTION BANK AMP**

**Q.1.** Differentiate between PAM and LBM with respect to principle, MRR, and suitability of machining ( At least one point each)

**Q.2.** State the reasons for providing closed loop control in CNC machines.

**Q.3.** State any three conditions under which automat is preferred over conventional machines

**Q.4.** State any three limitations of EDM process.

**Q5.** Differentiate between AJM and WJM (At least four points each)

**Q.6.** Describe the concept of ‘Adaptive Control’ with example.

**Q.7.** State advantages and limitations of broaching operation. (At least two each)

**Q.8.** With neat sketch, write step by step process of Wire Cut EDM. State any two applications also.

**Q.9.**) Why gear finishing operation is necessary and states its any three methods.

**Q.10.** Differentiate between dressing and truing of grinding wheel with respect to need, tools, and effects of not doing it.

**Q.11.** Differentiate between preventive maintenance and condition based maintenance (At least three points)

**Q.12.** State one application of the following super finishing processes

a) Buffing, b) Burnishing c) Lapping

a) An indexing device has brown & sharp plates as given below,

Plate No 1 – 15, 16, 17, 18, 19, 20

Plate No 2 – 21, 23, 27, 29, 31, 33

Plate No 3 – 37, 39, 41, 43, 47, 49

A gear is to be cut with 60 teeth. Calculate No of turns of index plate using simple indexing method. Also calculate No of turns of index plate for cutting gear of 35 teeth using appropriate index plate

**Q.13.** State the basic steps in the routine maintenance of

a) Flexible coupling, b) Drive chains

.

**Q.14.** With neat sketch, describe the construction of column and knee type milling machine stating function of each part.

**Q.15.** Describe the parameters considered in selection of grinding wheel. How grinding wheels are specified?

**Q.16.** Give four reasons supporting the need of development of non-traditional machining.

**Q.17.** Differentiate between absolute and incremental coordinate system used in CNC part programming with an example.

**Q.18.** Draw the sketch of the boring head. State the conditions under which it is used.

**Q.19.** Compare between EDM and wire cut EDM for its applications

**Q.20.** With a neat labeled sketch, describe Laser Beam Machining process w.r.t. its principle, applications and limitations.

**Q.21.** With a neat sketch, describe the principle of PAM

**Q.22.** State the purpose of providing dry run facility and Jog mode for CNC machine.

**Q.23.** Describe how a grinding wheel is specified with an example.

**Q.24.** Two gears are to be manufactured with 25 and 35 teeth. Using simple indexing method, calculate number of turns for indexing. Consider standard sharp & brown plates.

**Q.25.** State types of maintenance applicable for Machine tools. Describe any one of them.

**Q.26.**. Following are the machining requirements. Select appropriate non-traditional machining method for each with justification

i. Deep drilling

ii. Machining of injection moulding mould

iii. Profile cutting of turbine blade

iv. Die block used in press tools

**Q.27.** Describe construction and working of column and knee type milling machine with neat sketch.

**Q.28.** Differentiate between straddle milling and gang milling. (Four points)

**Q.29.** State different types of milling cutters mentioning the names of operations for which they are used.

**Q.29.** State the advantages of centerless grinding.

**Q.30.** How information collected from maintenance record, is useful for maintenance of a particular equipment?

**Q.31.** List different types of gear finishing methods. Describe any one in detail.

**Q.32.** Small MS pin of 10 mm dia and 80 mm long are to be ground on external surface in the batch of 5000. Select suitable grinding process for mass production with justification. Draw neat sketch and describe the process with respect to operation.

**Q.33.** What is “Repair Complexity”. How it is important in preparing maintenance schedule. Also state significance of “repair cycle”.

**Q.34.** With a neat sketch, describe working principle of honing process. State its two applications.

**Q.35.** Compare gear shaping and gear hobbing process with respect to accuracy, rate of production, quality and types of gears produced (At least one each)

**Q.36.** A “T” slot is to be manufactured. Describe the machining processes involved and the tools required for it.

**\Q.37.** Differentiate between capstan and turret lathe. (At least four points each)

**Q.38.** Draw the neat labeled sketch of a broach and state the function of each element.

**Q.39.** Why gear finishing operation is required? Compare gear burnishing with gear grinding.(At least four points each)

**Q.40.** State advantages and limitations of broaching process. (At least four points each)

**Q.41.** State the general maintenance problems faced and their remedies related with a) bearings b) belts

**Q.42.** Sketch any four profiles which can be produced by broaching process.

**Q.43.** State the significance of – G01, G04, M06, M03 in part programming