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**Code No. : 22213**

# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

## B.E. (E.E.E.) II Year II-Semester Main & Backlog Examinations, May-2017

## Power Systems - I

Time: 3 hours Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

### *Part-A (10 × 2 = 20 Marks)*

1. Why the thermal power plant efficiency low?
2. What do you understand by Beam radiation and diffuse radiation?
3. What are the main components of over head lines?
4. Define GMD and write its equation for 3-ph line.
5. What is a load duration curve?
6. What are the needs for the combined working of the power plants?
7. Classify the wind power generating stations.
8. What are the different types of supports for overhead transmission lines?
9. Write short notes on transposition of transmission lines.
10. What are the Advantages of ring mains over radial power stations?

### *Part-B (5 × 10 = 50 Marks)*

11. a) What are the various parts & their function of a steam power station? [4]

    b) At a particular site the mean monthly discharge as follows. [6]

| Month | Discharge,$m^3/s$ | Month | Discharge,$m^3/s$ |
|---|---|---|---|
| January | 100 | July | 1000 |
| February | 225 | August | 1200 |
| March | 300 | September | 900 |
| April | 600 | October | 600 |
| May | 750 | November | 400 |
| June | 800 | December | 200 |

Draw hydrograph and flow duration curve.

12. a) Write short notes on Geo-thermal power station with neat sketch. [6]

    b) A domestic solar array of $100m^2$ area generates an average of 10 KW power during an average duration of 12hr/day. The cost of the array is Rs.10,000. Calculate the unit cost of energy if the working life is 5 Years. [4]

13. a) Explain the general construction of an underground cables. [5]

    b) A overhead line is supported on two poles 200 m apart having a difference in level of 10 m. the conductor diameter is 2 Cm and weight 2.3Kg/m. Find sag at lower support. Wind pressure is $57.5Kg/m^2$ of project area factor of safety T = $4,220Kg/cm^2$. [5]

*Contd... 2*

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14. a) Derive the expression for inductance of unsymmetrical transposed 1-Ø transmission line. [5]

    b) Calculate the capacitance of 1-Ø transmission line 35 Km long consisting of two parallel wires each 6 mm in diameter and 1.8 m apart the height of the conductor above the ground is 7.9m. [5]

15. a) List and explain different methods for power factor improvement. [6]

    b) A distribution T/F costs Rs.200000/- and has a useful life 20 yrs. If the salvage value is Rs.10000/- and rate of annual compound interest is 8%, calculate the amount to be saved annually for replacement of the T/F after the end of 20yrs by sinking fund method. [4]

16. a) Write short notes on PWR type nuclear reactor with neat sketch. [6]

    b) Write short notes on hybrid power generation. [4]

17. Answer any ***two*** of the following:

    a) Effect of wind and ice loading on sag calculations. [5]

    b) Define power factor, what are the causes and disadvantages of low power factor? [5]

    c) Derive the expression for capacitance of unsymmetrical transposed 3-Ø transmission line. [5]

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# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

**B.E. (Mech. Engg.) II Year II-Semester Main & Backlog Examinations, May-2017**

## Applied Thermodynamics

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

***Part-A (10 × 2 = 20 Marks)***

1. Define volumetric and isothermal efficiency of an air compressor.
2. List out important advantages of a multistage compressor with intercooler over a single stage one.
3. What are the limitations of a simple carburretor?
4. How are internal combustion engines classified?
5. Explain briefly Octane rating of SI engine fuels.
6. What are the types of SI engine combustion chambers?
7. List out the differences between the jet and surface condensers.
8. List the boiler mountings.
9. Show the Rankine cycle on *p-v* and *T-s* plots.
10. Define nozzle efficiency and nozzle exit velocity.

***Part-B (5 × 10 = 50 Marks)***

11. a) Develop the work done expression for a single stage compressor i) with clearance, and ii) without clearance. [5]

    b) A single stage reciprocating air compressor has a bore of 200 mm and stroke of 300 mm. It receives air at 1 bar and 20°C and delivers it at 5.5 bar. If the compression follows the law $PV^{1.3} = C$ and clearance volume is 5 % of the stroke volume, determine *i)* mean effective pressure and *ii)* power required if the compressor runs at 500 rpm. [5]

12. a) Explain the operation of dry sump lubrication system with the help of neat sketch. [4]

    b) The output of an I. C. Engine is measured by a rope brake dynamometer. The diameter of the brake pulley is 75 cm and rope diameter is 5 cm. The dead load on the light side of the rope is 41 kg and the spring balance reading is 5 kg. The engine consumes 4 kg/hr of fuel at rated speed of 1000 rpm. The calorific value of fuel is 44000 kJ/kg. Determine the brake power, brake specific fuel consumption and brake thermal efficiency. [6]

13. a) Explain the combustion phenomenon in S.I. Engines with the help of p – Θ diagram. [5]

    b) What is meant by direct and indirect injection combustion chamber? Explain with the help of neat sketch the swirl combustion chamber of CI engine. [5]

14. a) Explain the operation of fusible plug and feed check valve with the help of neat sketches. [6]

    b) In a boiler, feed water supplied per hour is 205 kg while coal fired per hour is 23 kg. Net enthalpy rise per kg of water is 145 KJ for conversion to steam. If the calorific value of coal is 2050 KJ/Kg, determine the boiler efficiency. [4]

*Contd... 2*

15. a) Explain the effect of friction in nozzle flow with the help of *h-s* diagram. [4]

    b) A group of convergent-divergent nozzles are supplied with steam at a pressure of 2 $MN/m^2$ and a temperature of 325 °C. Supersaturated expansion according to the law $PV^{1.3}$ = constant, occurs in the nozzle down to an exit pressure of 0.36 $MN/m^2$. Steam is supplied at the rate of 7.5 ks/s. Determine the required throat and exit areas. [6]

16. a) Discuss a two stage compressor with a neat schematic diagram and also represent the processes on *p-v* diagram. [5]

    b) During the testing of a 4-stroke oil engine fitted with a simple rope brake dynamometer the following readings were taken. [5]

    Brake wheel diameter = 60 cm, brake rope dia. = 2.5 cm, dead load on the brake=200 N, spring balance reading = 50 N, speed = 450 rpm, area of the indicator diagram= 4.2 $cm^2$, length of the indicator diagram = 6 cm, spring constant = 6 bar/cm, bore =10 cm, stroke = 15 cm, bsfc = 0.3 kg/kWhr, calorific value of the fuel = 43960 kJ/kg. Determine the brake power, indicated power, mechanical efficiency, brake mean effective pressure and indicated thermal efficiency.

17. Write short notes on any ***two*** of the following:

    a) Knocking phenomena in C.I. engines [5]

    b) Surface condensers [5]

    c) Supersaturated flow in nozzles. [5]

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# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

## B.E. (E.C.E.) II Year II-Semester Main Examinations, May-2017

## Elements of Mechanical Engineering

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

### *Part-A (10 × 2 = 20 Marks)*

1. State Zeroth law of thermodynamics.
2. Sketch Otto cycle on p-v plane and name the processes.
3. Define thermal capacity and thermal diffusivity.
4. Distinguish between parallel and cross flow heat exchanger.
5. What are various types of refrigerants?
6. List out various psychrometric processes.
7. Sketch different flames used in gas welding process.
8. Name few engineering components that are produced by die casting.
9. Give some examples of sliding and turning pairs.
10. Deduce expression for Belt tensions ratio when a flat belt is on flat pulley.

### *Part-B (5 × 10 = 50 Marks)*

11. a) Explain the SFEE (Steady flow energy equation) and apply to Steam boiler and Steam condenser. [4]

    b) A twin cylinder four stroke engine develops an Indicated power of 15 kW at 1200 rpm. The indicated mean effective pressure is 6 bar. Determine the bore and stroke of the engine if stroke (L) = 1.2 Bore (D). [6]

12. a) The wall of a room consists of three parallel layers in contact of cement, brick and wood of thickness 20 mm, 300 mm, 10 mm respectively. Determine how much heat passes by conduction per square metre of wall. If the temperature of air in contact with the wall is $5^0$C outside and $30^0$C inside. The value of thermal conductivity for cement =0.29W/mK, brick = 0.46W/mK and Wood = 0.167W/mK. [5]

    b) Derive an expression for LMTD of parallel flow heat exchanger and state the assumptions made. [5]

13. a) Explain the working of Bell Coleman refrigerator with the help of a neat sketch and represent it on P-v and T-s Plane. [6]

    b) Compare vapor absorption refrigeration system with Vapor compression refrigeration system. [4]

14. a) Explain the working principle of basic sand casting with a neat diagram. [5]

    b) Explain various machining operations that can be performed on lathe machine. [5]

*Contd... 2*

15. a) Sketch a simple compound gear train with the help of four spur gears and deduce the expression for velocity ratio. [6]

    b) A pulley 280 mm diameter is driven to 400 rpm by a belt of 10 mm thick. The tensions in the tight and slack sides of the belt are 1500N and 450N respectively. Determine the power transmitted. [4]

16. a) Derive an expression of work done by an ideal gas when it undergoes isothermal expansion process. [5]

    b) Determine the heat transfer rate per unit area, by means of conduction for a furnace wall made of fire clay. Furnace wall thickness is 150mm. Thermal conductivity of the furnace wall clay is 0.3 W/mK. The furnace wall temperature can be taken same as furnace operating temperature which is $650^0$C and temperature of the outer wall of the furnace is $150^0$C. [5]

17. Write short notes on any ***two*** of the following:
    a) Working of vapour compression refrigeration system. [5]
    b) Various machining operation carried out on a drilling machine. [5]
    c) Different belt drives. [5]

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**Code No. : 22013**

# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

**B.E. (Civil Engg.) II Year II-Semester Main & Backlog Examinations, May-2017**

## Fluid Mechanics-I

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

***Part-A (10 × 2 = 20 Marks)***

1. Define Newton s law of viscosity.
2. Distinguish between laminar and turbulent flows.
3. Differentiate between free vortex flow and forced vortex flows.
4. Define absolute pressure.
5. Name the different forces present in a fluid flow.
6. Differentiate between weir and notch.
7. What is the relation between pressure and density of a compressible fluid for isothermal process and adiabatic process?
8. Differentiate between zone of action and zone of silence in Mach cone.
9. List out minor losses in pipe flow.
10. Distinguish between stream line and path line.

***Part-B (5 × 10 = 50 Marks)***
***(All bits carry equal marks)***

11. a) Explain the phenomenon of capillarity. Obtain the expression for capillarity rise of a liquid.

    b) The velocity distribution over a plate is parabolic with vortex 30 cm from plate where velocity is 1.8 m/s if the viscosity of the fluid is 0.9 NS/$m^2$. Find velocity gradient and shear stress at 0, 15, 30 cm respectively from the plate.

12. a) Derive Bernoulli's equation from Euler's equation of motion in 3-D clearly stating the assumptions.

    b) For the velocity components in a fluid flow given by u=2xy and $v = a^2 + x^2 - y^2$, show that the flow is possible. Obtain relevant stream function and velocity potential function.

13. a) Explain the working of Rotameter with a neat sketch.

    b) An orifice meter with orifice diameter 10 cm is inserted in a pipe of 20 cm diameter. The pressure gages fitted upstream and downstream of the orifice meter gives reading of 19.62 N/$cm^2$ and 9.81 N/$cm^2$. Take $C_d$ as 0.6. Calculate the discharge.

14. a) Derive the equation for velocity of pressure wave in a compressible fluid.

    b) An air plane is moving in an atmosphere with pressure 44 kpa (abs) and density 0.63 kg/$m^3$. A pitot tube on the plane records the stagnation pressure as 70 kpa (abs). Estimate the speed of the plane and stagnation temperature. k = 1.4 and R = 287 J /kg $^0$k.

*Contd...2*

15. a) Explain the Reynold's experiment with neat sketch. What is its significance in pipe flow?

    b) An oil of viscosity 0.2 N-s/$m^2$ and relative density 0.9 is flowing through a circular pipe of diameter 50mm and 350m. The rate of flow of fluid through pipe is 4lt/s. Find the pressure drop in a length of 350m and also the shear stress at the pipe wall.

16. a) Define flow net and write its uses.

    b) Write a note on body forces and surface forces.

17. Write short notes on any **two** of the following:
    a) Pitot tube
    b) Mach angle and mach number
    c) Pipes in series and parallel.

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**Code No. : 22113**

# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

## B.E. (C.S.E.) II Year II-Semester Main Examinations, May-2017

## Microprocessors and Interfacing

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

***Part-A (10 ×2 = 20 Marks)***

1. Draw flag register of 8085 and write function of each flag.
2. Perform the logical operations RLC and RRC when accumulator contents are 10100111 and CF = 0.
3. How many memory locations can be addressed by a microprocessor with 14-address lines?
4. Write different DMA modes of data transfer.
5. Differentiate between BSR and I/O modes of 8255 PPI.
6. Give the status register of 8251 and explain each bit.
7. Name the five interrupt sources of 8051.
8. How does the 8051 Microcontroller differentiate among a positive number, a negative number, and a bit pattern?
9. Distinguish between synchronous and asynchronous serial communication.
10. List different applications of Microcontrollers.

***Part-B (5 × 10 = 50 Marks)***
***(All bits carry equal marks)***

11. a) Describe addressing modes of 8085 Microprocessor with example.
    b) Write logical steps to add the following two Hex numbers. Both the numbers should be saved for future use. Save the sum in the accumulator.
    Numbers: A2H and 18H

12. a) What is DMA? Explain DMA controller with neat diagram.
    b) If the program counter is always one count ahead of the memory location from which the machine code is being fetched, how does the microprocessor change the sequence of program execution with a jump instruction?

13. a) Explain programmable interval timer with neat diagram.
    b) Write an assembly language program to display 'CSE' using 8279 keyboard interfacing.

14. a) Draw the architecture of 8051 Microcontroller and explain its features in detail.
    b) Explain program control and branch instructions of microcontroller.

15. a) Explain interfacing of 8051 microcontroller with DAC.
    b) How to put 8051 micro controller in idle mode explain.

16. a) Classify the instruction set of 8085 microprocessor with example.
    b) If the clock frequency is 10 MHz, how much time is required to execute an instruction of 18 T-states.

17. Write short notes on any ***two*** of the following:
    a) RS232 method of serial data transfer.
    b) Memory organization of 8051 microcontroller.
    c) Interface 8kx 8 data RAM with microcontroller.

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# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

## B.E. (I.T.) II Year II-Semester Main & Backlog Examinations, May-2017

## OOP using Java

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

***Part-A (10 × 2 = 20 Marks)***

1. Illustrate with an example why java is Robust.
2. What does the following statement prints?

   System.out.println("ab"+2+3);
3. What is serialization? How it is performed?
4. Identify the purpose of finally keyword.
5. What is the purpose of a StringTokenizer class? List the methods of it.
6. List different Collection classes present in util package.
7. Define an applet.
8. Write the difference between a TextField and a TextArea.
9. Write any two applications of Swings.
10. Why Swing components are called light weight components?

***Part-B (5 × 10 = 50 Marks)***

11. a) What is a package? Explain different access specifiers and their visibility in Java along with an example. [5]
    b) Write a program to demonstrate Dynamic Method Dispatch. [5]
12. a) Distinguish between checked and unchecked exceptions with examples. [4]
    b) What are the different ways to create a thread? Illustrate any four methods of Thread class by creating a new thread. [6]
13. a) List the methods of Date and Calendar classes to display the current date and time. [5]
    b) Write a java program to illustrate various methods of LinkedList class. [5]
14. a) Write and explain various sources of events. [4]
    b) Discuss about different types of Layout managers and write a program to implement Grid Layout. [6]
15. a) Explain the features of Swings. [5]
    b) Write a java program to illustrate a simple Swing application. [5]
16. a) Discuss about Nested classes and Nested interfaces with examples. [5]
    b) Write a program to concatenate two files. [5]
17. Write short notes on any **two** of the following:
    a) Collection Interfaces. [5]
    b) Applet life cycle. [5]
    c) The origin of Swings. [5]

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**Code No. : 22113 O2**

# VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

## B.E. (C.S.E.) II Year II-Semester Backlog Examinations, May-2017

## Microprocessors and Interfacing

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

***Part-A (10 × 2 = 20 Marks)***

1. Explain the function of ALU and IO/M signals in the 8085 architecture.
2. Perform logical operations RAL, RAR if Accumulator contents = 10100111, CF = 0.
3. Write a program to
   a) clear the accumulator
   b) add 47H
   c) Display the results after subtracting 92H and after adding 64H
4. When a POP operation is performed on a stack, what is the total effect of this in microprocessor?
5. Specify the register contents and the flag status(S,Z,CY) after the instruction ORA A is executed.

   MVI A,A9H
   MVI B,57H
   ADD B
   ORA A
6. Give the difference between JZ and JNZ.
7. How can you put the 8051 in Idle Mode?
8. Why the number of out ports in the peripheral-mapped I/O is restricted to 256 ports?
9. What are the two modes of DMA execution?
10. How many interrupts are there in 8086?

***Part-B (5 × 10 = 50 Marks)***
***(All bits carry equal marks)***

11. a) Illustrate the instruction sets of 8085.
    b) Write instructions to clear the CY flag, to load number FFH in register C, and to add 01 to register C. If the cy flag is set, display 01 at the output port: Otherwise display the content of register C.
12. a) Draw and explain Programmable Interrupt Controller.
    b) Write an assembly language program to multiply two 8-bit numbers residing in memory.
13. a) Draw and explain keyboard interfacing with 8085.
    b) Write an assembly language program to display character 'A' using keyboard interface.
14. a) What are the addressing modes in 8051 explain each with an example?
    b) Compare various families of 8-bit micro controllers.
15. a) What are the differences between 8-bit, 16-bit and 32-bit microprocessors? Explain.
    b) Draw the register set of 8086 and explain each one in detail.
16. a) Draw the timing diagram for MVI A,32h.
    b) Compare vectored and non-vectored interrupts in 8085.
17. Write short notes on any **two** of the following:
    a) RS 232C
    b) Interfacing of DAC
    c) Multi-Core Processors

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