FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I – Semester (Supplementary) Examination, May / June 2018

Subject: Reinforced Cement Concrete

Time: 3 Hours   **Max.Marks: 75**

Note: Answer all questions from Part A & any five questions from Part B.

PART – A (25 Marks)

1 How do you find moment of resistant of a beam section in working stress method?   3

2 Discuss I.S. code provisions for the design for torsion?   2

3 What are the development length requirement s at simple support?   3

4 What is the limit state of serviceability .What are the various serviceability requirements as per I.S 456?   3

5 What is the function of transverse reinforcement in a R.C. column?   2

6 What are the assumptions made for the limit state design of compression members?   2

7 Calculate the punching shear stress a footing 1.5mx1.5m and 300mm thick supporting a column 300mm diameter. The column transfers a load of 800KN to the footing.   3

8 Sketch the reinforcement details of a continuous one way slab at an intermediate support?   2

9 Explain short term and long term deflections?   2

10 What is meant by moment of inertia of R.C.C. section? What are the I.S. code methods?   3

PART – B (5x10 = 50 Marks)

11 A reinforced concrete beam has section 230mm wide and 500mm deep. The beam is reinforced with 4 bars of 16mm diameter on tension side. it has an effective cover of 50mm to the center of reinforcement. It is subjected to a bending moment of 80 KNm. Determine the stresses develop in steel and concrete. Take m=15. Use working stress method.

12 A doubly Reinforced concrete beam of rectangular section has a width of 250mm and depth of 500mm.The effective of cover to tension and compression reinforcement are 40mm and 30mm respectively. The beam reinforcement consist of four bars of 20mm diameter in tension and 3 bars of 16mm diameter in compression, Find the limiting moment carrying capacity of the beam. The grade of concrete is M20 and steel Fe 415. Use limit state design method.   10

13 Design a T shape beam section consisting of a flange a width 1200mm and depth 120mm. the beam is subjected to a factored moment of 300KNm.use M20 grade concrete and Fe 500 grade of steel. Use limit state design method.   10

14 Design a two way slab supported on its all four edges, over of room of size 5mx6m. Two adjacent edges of the slab are discontinuous and the remaining two are continuous. The weight of the floor finish may be taken as 0.6KN/m^2 on the slab. Use M20 grade of concrete and Fe 500 grade of steel. Use limit state design method.   10

15 Design a square reinforced concrete axially loaded column to carry an all inclusive axial load of 1200KN.The height of the column is 5m.Use M20 grade of concrete and Fe500 HYSD bars. Use limit state design method.   10

16 Design a square footing to support a column 400mm x 400 mm in size with 8-16 mm diameter bars. The column transfers a load of 1100 KN to the footing. The safe bearing capacity of soil is 150KN/m^2. Use M20 grade of concrete and Fe 500 HYSD bars. Use limit state design method.   10

17 a) Write a note on construction of design charts of column.   5

   b) Write a brief note on the analysis of two way slab using yield line theory.   5

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FACULTY OF ENGINEERING

B.E 3/4 (Inst.) I – Semester (Supplementary) Examination, May / June, 2018

Subject : Instrumentation Systems

Time : 3 Hours   **Max Marks : 75**

Note: Answer all questions from Part – A & Any five questions from Part – B.

Part – A (25 MARKS)

1. State working principle of Electrical tacho – generator   3

2. How much degrees the strain gauges should be mounted along the shaft axis?   2

3. Mention the law of Thermocouple   2

4. Explain measurement of stress in hollw shaft with diagram   3

5. An accelerometer has a seismic mass of 0.05kg and a spring constant of 3×10^3N/m, maximum mass displacement is 0.02m. Calculate maximum measurable acceleration   3

6. Draw the diagram of Electromagnetic flow – meter   2

7. Explain basic principle of measurement of flow   3

8. Define Absolute Humidity and Relative Humidity   2

9. What ate the significant characteristics of piezo- electric microphone?   3

10. Explain the working of carbon microphone   2

PART-B Marks: (50 Marks)

11. A) Explain the working of a DC tachogenerator with suitable diagram   5
    B) Write short notes on Strain gauges   5

12. A) Explain the Magneto – Strictive transducer used for torque measurement using suitable diagram   5
    B) A bimetallic strip element has one end fixed and other free with length of cantilever being 40mm. The thickness of each metal is 1mm and element is initially straight at 20C Calculate the movement in free end in perpendicular direction from the initial line when the temperature is 180°C   5

13. Explain various kinds of Head – type flow meter depending on the physical principle of operation and other characteristics with suitable diagrams and equations.   10

14. A) Explain the measurement of Liquid level with variable permeability method   5
    B) Explain with suitable diagram the working Principle of Ultrasonic method of measurement of Liquid.   5

15. A) Explain briefly the installation of pH meter with suitable diagram   5
    B) Explain the working of Inductive microphone with suitable diagram   5

16. A) A piezo-electric accelerometer has a transfer function of 61mV/g and a natural frequency of 4500Hz. In a vibration test at 110Hz, A reading of 3.67 peak is obtained. Find the vibration peak displacement 5

B) A load cell consist of a solid cylinder of steel 40 mm in diameter with four starin gauges bonded to it and connected into four arms of voltage sensitive bridge. The gauges are mounted to have Poisson arrangement. If G_f=2.1, and the bridge excitation voltage 6V, determine the sensitivity of the cell in V/ kN.[E=200GN.m^2 v=0.29]. 5

17. A) Discuss the various types of liquid level meters 5

B) Write short notes on capacitive Hygrometer 5

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FACULTY OF ENGINEERING
BE 3/4 (ECE) I - Semester (Supplementary) Examination, MAY / June 2018
Linear Integrated Circuits & Applications

Time: 3 Hours   **Max Marks: 75**

Note: Answer all questions from **Part-A.** Answer any **five** questions from **Part-B.**

Part - A (25 Marks)

1. Define i) Slew rate ii) CMRR iii) PSRR   (3)
2. Explain the terms balanced output and unbalanced output?   (2)
3. Explain why open loop op-amp configurations are not used in linear applications?   (2)
4. Draw an antilog Amplifier circuit using op-amp?   (3)
5. Design a first order Butterworth filter having f_h= 2 KHz?   (3)
6. Explain comparator using Op-amp?   (2)
7. Draw the Pin Configuration of IC 566 VCO?   (2)
8. Explain the block diagram of PLL?   (3)
9. Write the advantages and disadvantages of Successive approximation A/D converter?   (2)
10. List and explain the characteristics of three terminal voltage regulators?   (3)

PART - B (50 Marks)

11 a) Explain the DC and AC analysis of dual input and balanced output differential amplifier?   (6)

   b) What is meant by level translator? Explain level translator with neat circuit?   (4)

12 a) Design an Integrator which integrates input signal at in frequency 10 KHz.   (6)
   b) If a sine wave and square of $1V_{p-p}$, 5KHz is applied find output voltage V_o for

      both the signals and draw output wave forms.   (4)

13 a) Explain the operation of triangular waveform generator using op-amp and derive the expression for frequency of operation?   (6)
   b) Draw the circuit of VLO and explain its operation?   (4)

14 a) With neat diagram explain the operation of Sample and Hold circuit using Op-Amp?   (5)

   b) Draw and explain full wave precision rectifier using Op-Amp?   (5)

15 a) Draw functional diagram of IC 723 regulator? Explain its operation?   (5)
   b) A 16 bit DAC has a step size of 9 mV. Determine the full scale output voltage,

      percentage resolution and output voltage for the input of (1011011001011111)?   (5)

16 a) Design monostable multivibrator using 555 timer to generate a pulse width of 75ms?   (5)
   b) Explain the operation of clamper using OP –Amp?   (5)

17 a) What is an instrumentation amplifier? Explain its principle of operation?   (4)
   b) Derive the expression for free running frequency of the Astable multivibrator using Op-amp?   (6)

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FACULTY OF ENGINEERING

BE 3/4 (Prod.) I-Semester (Supply) Examination, May / June 2018

Subject: Applied Thermodynamics and Heat Transfer

Time: 3hours   **Max. Marks: 75**

Note: Answer All Questions From Part - A, & Any Five Questions From Part – B.
Note: Assume suitable data, if required for solving the numerical

Part-A (25 Marks)

1. Sketch actual P-V diagram for single – stage compressor?   3M

2. Define   2M
   a) Isothermal efficiency   b) Mechanical efficiency

3. Classify the internal combustion engine with respect to   3M
   i) Cycle of operation   ii) Types of fuels used.

4. Mention assumptions made in air standard cycle analysis?   2M

5. What are different air – fuel mixture on which an engine can be operated?   3M

6. What are the functional requirement s of an injection system?   2M

7. Write short notes on critical radius of insulation?   3M

8. Write the general conduction equation in Cartesian coordinates?   2M

9. State and explain Buckingham theorem?   3M

10. What is the significance of krichoff's law of radiation?   2M

Part-B (50 Marks)

11. A single – stage, double acting compressor has a free air flow delivery (F.A.D) of $14m^3$/min measured at 1.013 bar and 15^oC. The pressure and temperature in the cylinder during induction are 0.95 bar and 32^oC. The delivery pressure is 7 bar and index of compression and expansion n = 1.3. The clearance volume is 5% of the swept volume. Calculate
    i) Indicated power required.   ii) Volumetric efficiency

12. A two stroke cycle CI engine delivers a brake power of 368KW while 73.6KW is used to overcome the friction losses. It consumes 180Kg/h of fuel at an air –fuel ratio of 20:1. The heating value of the fuel is 42000KJ/Kg. calculate
    i) Indicated power   ii) Mechanical efficiency
    iii) Air consumption   iv) Indicated thermal efficiency
    v) Brake thermal efficiency.

13. Bring out clearly the process of combustion in CI Engines.

14. The temperature of the inner side of a furnace wall is 640^oC and that of the outer side is 240^oC. It is exposed to the atmosphere at 40^oC. In order to reduce the heat loss from the furnace, its wall thickness is increased by 100%. Calculate the percentage decrease in the heat loss due to increase in wall thickness. Assume no change in properties except temperature.

15. A coaxial tube counter flow heat exchanger is to cool 108 Kg/hr of fluid oil from 87°C to 37°C with a counter flow of 72Kg/hr of water at 17°C. If the inner tube outside diameter is 0.02m and the overall heat transfer coefficient based on outside area is 650W/m²K. Determine the required length of the exchanger. Take specific heat of the fluid oil 1880J/Kg K and specific heat of water is 4175J/Kg K.

16. Explain the phenomenon of knock in CI engine and compare it with SI engine knock?

17. Write short notes on
    a) Reynolds Number
    b) Prandtl Number
    c) Nusselt Number
    d) Stanton Number
    e) Grashof Number

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FACULTY OF ENGINEERING

B.E. 3/4 (AE) I-Semester (Supplementary) Examination, May / June 2018

Subject : Automotive Diesel Engines

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. Define the following terms
   a) Swirl   b) Squish
2. Define cetane number and explain how it is obtained.
3. What is a common rail fuel injection system?
4. What is injection timing? On what parameters it depends.
5. Define Delay period and knocking.
6. What is the need of charge cooling?
7. What are the merits of super charging?
8. What are Bharat and Euro norms?
9. What are the methods to improve engine performance?
10. How engine indicated power can be measured?

PART – B (50 Marks)

11. a) Derive an expression for air standard efficiency of duel cycle.
    b) Write a short notes on spray formation.

12. a) With a neat sketch explain the working principle of mechanical governor.
    b) With a neat sketch explain the different types of fuel injectors used in diesel engine.

13. a) Describe with suitable sketches, the various stages of combustion in a diesel engine.
    b) Name the types of combustion chambers used in modern diesel engines.

14. a) What is turbo charging explain with suitable diagram and how it is advantageous?
    b) Explain different types of super charging and turbo charging.

15. Explain the variables that effect the performance of an automotive diesel engine and describe how the engine performance maps are obtained.

16. a) What are the different methods to analyse the exhaust gasses and explain each of them?
    b) Explain the effect of engine speed on engine performance characteristics.

17. The condition at the beginning of compression in air standard diesel cycle fixed by P_1 = 200 KPa, T_1 = 380K. The compression ratio is 20, cut off ratio is 1.8 for K = 1.4, Determine a) Maximum temperature in K b) The heat addition per unit mass c) The thermal efficiency.

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FACULTY OF ENGINEERING
B.E. 3/4 (CSE) I - Semester (Suppl.) Examination, May / June 2018

Subject : Database Management Systems

Time : 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (25 Marks)

1 Write about data abstraction. (2)
2 Differentiate between weak entity and strong entity. (3)
3 Define a) candidate key b) Super Key. (2)
4 Write about rename and division operators in relational algebra. (2)
5 Differentiate between Replace and Translate with example. (3)
6 Write about advantages of normalization. (3)
7 Draw and explain state diagram of transaction. (3)
8 What is functional dependency? (2)
9 Define recoverability. (2)
10 Write about buffer management. (3)

PART – B (50 Marks)

11 a) Explain briefly about database architecture. (5)
   b) Write briefly about E-R diagram with suitable examples. (5)

12 Discuss the fundamental and extended relational algebra operations with examples. (10)

13 Consider the employee database given below where primary keys are underlined and give (10)
SQL expressions for each of the following queries:
Employee (emp-name, street, city)
Works (emp-name, company-name, salary)
Company (Company-name, city)
Manages (emp-name, manager-name)
(a) Find the names and cities of residence of all employees who work for first Bank Corporation.
(b) Find the names, street addresses and cities of residence of all employees who work for first Bank Corporation and earn more than $10000.
(c) Find all employees in the database who don't work for first Bank Corporation.
(d) Find all employees in the database who earn more than each employee of small bank corporation.
(e) Find all companies located in every city in which small bank corporation is located.

..2

14 (a) Insert the following keys in a B+ - tree for order n given below   (5)
     (i) n=4 (ii) n=6
     2,3,5,7,9,11,17,19,23,29,31
  (b) Explain briefly about view serializability   (5)

15 a) How deadlocks are handled. Explain in detail.   (5)
  b) Write about multiple granularity and validation based protocol in detail.   (5)

16 a) Explain briefly about aggregate function with example query.   (5)
  b) Explain different types of Joins with examples.   (5)

17 Write short notes on
  a) Storage structures.   (5)
  b) Log based recovery.   (5)

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FACULTY OF INFORMATICS

B.E. 3/4 (IT) I-Semester (Supplementary) Examination, May 2018

Subject : Database Management Systems

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A & any FIVE questions from Part-B.

PART – A (25 Marks)

1 Define Data Base Management System.   2
2 How to represent strong entity set with simple attributes? Give example.   3
3 What is the difference between relation cardinality and relation degree?   2
4 Explain basic structure of SQL query.   3
5 Define cascading revocation.   2
6 Define and explain first NF with example.   3
7 Differentiate between indexing and hashing.   2
8 List and explain ACID properties.   3
9 Explain various categories of failure in DBMS.   2
10 Define and explain 2PL protocol.   3

PART – B (50 Marks)

11 Explain various components in architecture of database with the help of a
   diagram.   10

12 Explain various basic relational algebra operations with examples.   10

13 Define and explain types of integrity constraints in SQL with examples.   10

14 Explain procedure to insert following key values into B^+ - Tree with appropriate
   representation.   10
       5   15   25   35   45   55   65   75   85   95   99
   With number of pointers in each node is 4.

15 How to test for conflict Serializability? Explain with example.   10

16 Explain about a) Difference between 3NF and BCNF   5
                  b) Bit map indices   5

17 Write short notes on :
   a) Weak entity set   3
   b) Thomas write rule   2
   c) Cascadeless schedule   3
   d) Assertion   2

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FACULTY OF ENGINEERING & INFORMATICS

B.E. (Civil/EE/INST/IT) IV - Semester (CBCS) (Main) Examination, May/June 2018

Subject : Managerial Economics and Accountancy

Time : 3 Hours   Max. Marks: 70

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

1   What do you understand by Pi in economics?
2   Write short notes on Scarcity?
3   Write about cross demand?
4   What is elastic and inelastic demand?
5   Define production functions?
6   What is Marginal Cost?
7   List out the various sources of capital.
8   What is working capital?
9   Write the format of Journal?
10 How do you treat prepaid expenses in final accounts?

PART-B (50 Marks)

11 Discuss the different tools of managerial economics?
12 State and explain law of demand and law of supply and how they are different from each other?
13 Explain the law of diminishing marginal returns clearly with diagram and example?
14 Explain the accounting principles?
15 What is BEP? Draw break even chart and what do you mean by angle of incidence?
16 The following information is given
        Selling price per unit = Rs. 40/-
        Variable cost per unit = Rs.24/-
        Fixed cost = Rs 16000/-
        Find   1. p/v Ratio
                    2. sales to earn a profit of Rs.2000/-
                    3. profit when sales are Rs. 60,000/-
                    4. break even sales
17 Prepare Khan & Co. ledger from the following transactions
        2017   June 1- sold good to Khan & Co Rs.1000/-
                    June 2- purchased good from Khan & Co. Rs. 1400/-
                    June 3- received cash from Khan & Co. Rs.2000/-
                    June 4- paid to Khan & Co. Rs. 1000/-

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FACULTY OF ENGINEERING
B.E. 3/4 (EEE) I - Semester (Suppl.) Examination, May / June 2018

Subject : Power Systems – II

**Time : 3 Hours**   **Max. Marks: 75**

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (25 Marks)

1. Define the term "Corona". (2)
2. A single circuit 50 Hz, 3-ph transmission line has R = 0.2Ω, L = 1.3 mH and C=0.01μF. The voltage at the receiving end is 132kV. If the line is open at receiving end, find the rms value and phase angle of the incident and reflected voltage to neutral at the receiving end. (3)
3. Show that in case of a single transmission line the receiving voltage is not affected much due to the real power component of the load. (Assume V_S is constant). (3)
4. Write the principle of operation of Thyristor switched capacitor (TSC). (2)
5. For a 50 MVA, 11KV, 3-ph synchronous generator, it is given that three phase fault current is 2000A and line to line fault current is 2800A. The generator neutral is solidly grounded. Find the per unit value of negative sequence reactance of generator. (3)
6. Four identical altenators each rated for 20 MVA, 11KV, having a sub transient reactance of 16% are working in parallel. Find the short circuit level at the bus bars. (2)
7. Write the significance of positive, negative and zero sequence components. (3)
8. Write the advantages of per unit system. (2)
9. Draw the variation of voltage and current in a short circuited line with represent to time and length. (3)
10. Mention the causes of over voltages in a 3-ph transmission line. (2)

PART – B (50 Marks)

11. (a) Determine the voltage at the generating station and the efficiency of transmission for the 1-phase power system show in below figure.
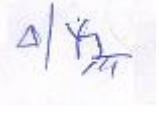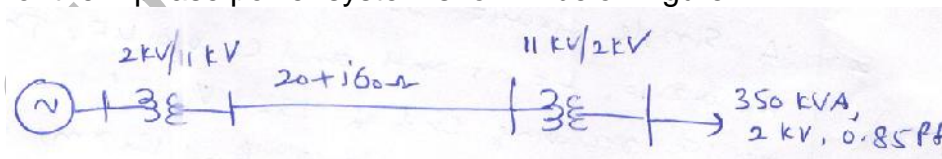

    transformer ratio 2kV/11kV, the resistance of l.v. side = .03Ω and h.v.side is 1.8Ω. Reactance on l.v. side and h.v. side is 0.156Ω and 4.8 ohm respectively. (5)

    (b) Obtain A, B, C, D parameters of medium line in cese of nominal 'T' models. (5)

12. (a) With the help of a neat diagram, explain the operation of a on load tap changing transformers. (4)

    (b) A 3-ph induction motor delivers 500 HP at an efficiency 90% when the operating power factor is 0.85 lag. A loaded synchronous motor with a power consumption of 130 kW is connected in parallel with the induction motor. Calculate the necessary kVA and the operating p.f. of the synchronous motor if the overall p.f. is to be unity. (6)

13 (a) Three generators are rated as follows:
generator 1 – 150 MVA, 33 kV, reactance 15%
generator 2 – 180 MVA, 32 kV, reactance 12%
generator 3 – 120 MVA, 30 kV, reactance 18%
Determine the reactance of generators corresponding to base values of
300 MVA, 35 kV. (4)

(b) A 33 kV, 3-ph transmission lien of resistance 2Ω and reactance 8 ohms
connected at each and to 3 MVA, 33/6.6kV, Δ/Y transformer. The resistance
and reactance of the transformer are 2% and 5% respectively. Determine the
fault current in each section of the system when a 3-ph fault takes place on
the low voltage side of the transformer. (6)

14 (a) Obtain the formula for fault current in case of L-L-G fault in 3ph abc
phase sequence power system. (5)

(b) Draw the positive, negative and zero sequence networks for the following
3ph transformer. (5)

(i) Y/Δ

(ii)

(iii) Δ/Δ and

(iv)

15 (a) What is a traveling wave? Explain the development of such a wave on an
overhead line. (5)

(b) An overhead transmission line with surge impedance 400Ω is 300 km long.
One end of the line is short circuited and at the other end a source of
11 kV is suddenly switched on. Calculate the current at the source end .005 sec
after the voltage is applicable. (5)

16 (a) Write the comparison between series and shunt compensation. (4)

(b) Derive for a long line the sending end voltage and current relations in
terms of receiving and voltage and current at the parameters of the line. (6)

17 Write short notes on the following:
(a) Reflection and refraction co-efficient of transmission lien for different conditions
(b) Symmetrical components of unsymmetrical phasors

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FACULTY OF ENGINEERING

B.E. 3/4 (MECH.) I-Semester (Suppl.) Examination, May/June 2018

Subject: APPLIED THERMODYNAMICS

Time: 3 Hours   **Max. Marks: 75**

Note: Answer all questions of Part-A & Answer any FIVE Questions from Part-B.

PART-A (25 marks)

1. What is multistage compression what are its advantages.

2. What is the effect of clearance volume on work done by reciprocating air compressors?

3. Sketch and label a simple carburetor.

4. What is variable specific heat?

5. What is delay period in engine combustion?

6. Define knocking in SI engines?

7. What is boiler draught?

8. Differentiate between Jet & Surface condensers.

9. Explain the process of regeneration of improving efficiency

10. Explain Rankine cycle with the help of P-V graph

PART-B (50 Marks)

11. (a) Derive the expression for the work done in case of two stage reciprocating air compressor with perfect intercooling.

(b) A two stage double acting air compressor, operating at 220 rpm takes in air at 1.0 bar and 27^0C. The size of LP cylinder is 360*400 mm; the stroke of HP cylinder is same as that of LP cylinder and the clearance of both cylinders is 4%. The LP cylinder discharges the air at a pressure of 4.0 bar. The air passes through the inter cooler so that it enters the HP cylinder at 27^0C and 3.80 bar, finally it is discharged from the compressor at 15.2 bar. The value of n in both the cylinders is 1.3, c_p=1.0035 kj/kg K, R= 0.287 kj/kg K.
Calculate (i) The heat rejected in the intercooler
       (ii) Diameter of HP cylinder
       (iii) The power required to drive HP cylinder.

12. (a) Explain the reason of deviation of actual cycles from air standard cycles.
(b) An engine is required to develop 100kW, the mechanical efficiency of the engine is 86% and the engine uses 55 kg/hr of fuel. Due to improvement in the design and operating conditions, there is reduction in engine friction to extent of 4.8 kW. If the indicated thermal efficiency remains the same, determine the saving in fuel in kg/hr.

13. Explain the stages of combustion in SI engines with the help of P- diagram.

14. (a) Explain the construction and working of Babcock & Wilcox Boiler.
    (b) What are Jet Condensers explain any one of Jet condenser.

15. In steam nozzle, the steam expands from 4 bar to 1 bar, the initial velocity is 60 m/s and the initial temperature is 200^0C. determine the exit velocity if the nozzle efficiency is 92%

16. (a) Classify Compressors.
    (b) Explain splash lubrication system.

17. (a) How air pollution is caused by engine exhaust & how to control it.
    (b) What are FBC Boilers?
    (c) Define critical pressure ratio in nozzles.

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