MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: VI (New)	Term	: II	Academic Year	: 2014-15
Course No.	: IDE 366	Title	: Minor Irrigation and Command Area Development		
Credits	: 3 (2+1)				
Day & Date	: Friday, 08.05.2015	Time	: 09.00 to 12.00	Total Marks	: 80

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 a) Enlist and explain in brief factors affecting duty of water.

b) Design a regime channel for a discharge of 50 cumecs and silt factor 1.1, using Lacey's theory.

Q.2 a) Enlist different types of canal lining materials.

b) The gross commanded area for a distributory is 6000 hectares, 80% of which is culturable irrigable. The intensity of irrigation for *rabi* season is 50% and that for *kharif* season is 25%. If the average duty at the head of the distributory is 2000 hectares/ cumec for *rabi* season and 900 hectares/ cumec for *kharif* season, find out the discharge required at the head of the distributory from average demand considerations.

Q.3 a) Write in brief about mechanics of sediment transport. Derive the equation for unit tractive force.

b) Design a lined channel to carry a discharge of 15 cumecs. The available and accepted country slope is 1 in 9000. Assume side slopes as 1.25H: IV and good brick work in lining having roughness coefficient as 0.015.

Q.4 a) Write down about the classification of command area.

b) Design a pipe outlet if.

1. Fully supply discharge at the head of water course - 90 lps
2. FSL in distributory - 205 m
3. FSL in water course - 204 m
4. C_d = 0.62. Assume other data, if necessary.

Q.5 a) Enlist different types of cross drainage works.

b) At a certain place in India, the transplantation of rice takes 16 days and the total depth of water required by the crop is 60 cm on the field. During this transplantation period of 16 days, rain starts falling and about 10 cm of rain is being utilized to fulfill the rice demand. Find the duty of irrigation water required for rice during transplanting period. Also find the duty at the head of watercourse assuming 25 per cent losses of water in watercourses.

Q.6 a) Enlist different parts of diversion head works.

b) If wheat requires about 7.5 cm of water after every 28 days and the base period for wheat is 140 days, find out the value of delta for wheat.

(P.T.O.)

Q.7 a) Enlist different types of canal falls.

b) Enlist the requirements of a good module.

Q.8 a) Write in brief about comparison between Kennedy's and Lacey's theory.

b) The head regulator of a canal has 3 openings each 3 m wide. The water is flowing between the upper and lower gates. The vertical opening of the gate is 1.0 m, The head on regulator is 0.45 m (afflux). If the upstream water level rises by 0.20 m, find how much the upper gates must be lowered to maintain the canal discharge unaltered?

Q.9 An unlined canal giving a seepage loss of 3.3 cumecs per million sq. metres of wetted area is proposed to be lined with 10 cm thick cement concrete lining, which costs Rs. 180.00 per 10 sq.m. Given the following data, work out the economics of lining and benefit cost ratio.

i) Annual revenue per cumecs of water from all crops = Rs.3.5 lakhs

ii) Discharge in the channel = 83.5 cumecs

iii) Area of the channel = 40.8 sq. m.

iv) Wetted perimeter of the channel = 18.8 metres

v) Wetted perimeter of the lining = 18.5 metres

vi) Annual maintenance cost of unlined channel per 10 sq.m. = Rs. 1.0

vii) Assume seepage loss in lined channel at 0.01 cumecs per million sq. m of wetted perimeter.

Q.10 Write short notes on (Any four).

1) Silt excluder
2) Alignment of the off-taking canal
3) Fish ladder
4) Maintenance of irrigation canal
5) Lane's weighted creep theory

SECTION "B"

Q.11 Fill in the blanks.

1) Garret's diagrams are used for applying _____ theory.
2) The minor has a discharge capacity less than _____ cumecs.
3) Lacey's theory is applicable only to channels under _____ regime conditions.
4) A _____ channel irrigates only on one side of the area.
5) The duty of water at the head of minor is always _____ than that at the head of watercourse.
6) Capacity factor is the ratio of the mean supply discharge to the _____.
7) For Froude number between 1.7 to 2.5, the hydraulic jump formed is called as _____.
8) An outlet is known to be sub- proportional, if its flexibility is _____ than unity.

Q.12 Define the following terms.

1) Spate irrigation
2) Delta
3) Incoherent alluvium
4) Paleo irrigation
5) Kor watering
6) Base period
7) Intensity of irrigation
8) Outlet discharge factor

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: **VI (New)**	**Term**	: **II**	**Academic Year**	: **2014-15**
Course No.	: EOES 365	**Title**	: **Renewable Energy Sources**		
Credits	: 3 (2+1)				
Day & Date	: Friday, 15.05.2015	**Time**	: 09.00 to 12.00	**Total Marks**	: **80**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 a) Explain in brief renewable energy sources.
b) What are the advantages of renewable energy sources?

Q.2 a) Write different advantages of solar energy conversion.
b) Derive the expression for power developed due to wind.

Q.3 a) Determine the size of heating array from the following factors. The daily heating needs of a home during the heating season are 100 kW-hr/day. The available daily insolation on the array is 4 kW-hr/m^2 day. Also assume that each panel has an area of 1.5 m^2, an efficiency of 50 % and that one third of the heating will come from auxiliary heaters.
b) Enlist the components of hydro-electric scheme with classification of small hydro power station? Give any two advantages and limitations of small scale hydropower station.

Q.4 a) Write important design considerations for fixed bed gratifier.
b) Describe basic photovoltaic system for power generation.

Q.5 a) Define Bio-diesel? Explain in detail Bio-diesel making process.
b) Explain in detail Thermochemical conversion process.

Q.6 a) State the factors affecting anaerobic fermentation for cow dung.
b) State the different types of Dryer? Explain in brief Natural convection type dryer.

Q.7 a) Calculate the approximate size of biogas plant for family of six members owing 4 cows, 2 buffaloes and 4 calves. Also calculate the requirement of biogas plant for cooking, lighting of two 100 cd powerlamp for 4 hrs. and generation of 3 kWh electricity for 1 hrs.
b) Explain about design principle and state in brief construction details of Box type solar cooker.

Q.8 a) Write about the Biomass process for fuel use? Explain in detail screw press technology.
b) Write the principle of energy conservation? Explain in brief about types of Energy audits.

(P.T.O.)

Q.9 Write short notes on (Any two).

1) Solar distillation
2) Benefits of Biogas
3) Advantages and disadvantages of wind energy

Q.10 a) Enlist the basic elements of a solar water heating system. explain thermo-siphon type water heater with neat sketch.

b) Differentiate between Updraft gasifier and Downdraft gasifier

SECTION "B"

Q.11 State True or False.

1) Petrol engine can run on 100% biogas.
2) Renewable energy sources are exhaustible.
3) In densification volumetric efficiency can be increased.
4) Binding material is to be added while preparing briquettes in high pressure briquetting machines.
5) Downdraft gasifier produces cleaner gas with relatively less amount of tars, compared to updraft gasifier.
6) In fixed dome type biogas plants digester should not be filled to more than 75-80% of its volume.
7) Repetitive source of energy is called renewable energy.
8) Ideal pH of slurry for biogas production is more than 8.5.

Q.12 Fill in the blanks.

1) Orientation of solar appliances is done _____ facing.
2) In dish type solar cooker, temperature achieved at the bottom of the vessel is _____.
3) In cattle dung the C: N ratio is usually around_____.
4) _____ is the key binding agent in high pressure briquetting.
5) The efficiency of hydroelectric power plant depends on effectiveness of _____.
6) It is recommended to use biodiesel with diesel in the proportion of _____ for running IC engines.
7) In _____ type gasifier, the feed materials descends from top to the bottom and the air ascends from the bottom to the top.
8) For large scale drying of food grains etc. _____ type of dryer is used.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: **VI (New)**	**Term**	: **II**	**Academic Year**	: **2014-15**
Course No.	: FS 365	**Title**	: **Design of Structures**		
Credits	: 3 (2+1)				
Day & Date	: Saturday, 16.05.2015	**Time**	: 09.00 to 12.00	**Total Marks**	: **80**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 a) A simply supported beam of 4.5 m span carries a uniformly distributed load of 30 KN/m inclusive of self-weight. The width of the beam is 230 mm and is reinforced on tension side only. Design the smallest concrete section. The material used are M 20 grade of Concrete and mild steel reinforcement. Assume load factor (L.F) equal to 1.5 f_{ck} = 20N/mm^2, f_y =250 N/mm^2

b) What are the different types of loads acting on roof trusses?

Q.2 a) Enlist the various types of roof trusses and show with neat sketches the major components of roof truss.

b) Write down the design steps for axially loaded compression member.

Q.3 A R.C. beam of rectangular section 230 mm wide and 400 mm deep is reinforced with 4 bars of 12 mm diameter provided with an effective cover of 31 mm. Calculate the ultimate moment of resistance of the section and the maximum uniformly distributed super-imposed load this beam can carry if it is simply supported over a span of 3.5 m. The materials used are concrete grade M 20 and steel grade Fe 415.

Q.4 Calculate the moment of resistance of a doubly reinforced R.C beam of rectangular section of size 300mm x 450 mm deep reinforced with 6-dia 20 mm bars on tension side. Use concrete grade M 20 and steel Fe 250. Assume effective cover of 35 mm on both sides f_{ck}= 20 N/mm^2 f_y = 250 N/mm^2 d_c=35 mm,

(a) 4-dia 20 mm bars on compression side.

Q.5 a) Discuss in brief the properties of concrete.

b) What are the various types of footing?

Q.6 a) Describe the classification of retaining wall.

b) What do you mean by bond? What are the different types of bonds?

Q.7 a) Calculate the area of steel required for a short R.C. column 400 x 450 mm in cross section to carry an axial load of 1160 KN. assume concrete grade M 20 and steel grade Fe 250.

b) What do you mean by one way and two way slabs.

(P.T.O.)

Q.8 a) Show the arrangement of transverse reinforcement in designing of column.

b) Show the pressure distribution under the footing.

Q.9 a) What do you mean by development length? State factors affecting development length.

b) What are the reasons for providing minimum shear reinforcement?

Q.10 Calculate the design constant for the following materials considering the balanced design for singly reinforced section. The materials are grade M 15conrete and mild steel reinforcement. $6_{cbc} = 5\ N/mm^2$, $6_{st}=140\ N/mm^2$.

SECTION "B"

Q.11 Fill in the blanks.

1) A strap footing or cantilever footing is one of the types of _____.

2) _____ is defined as plastic deformation under constant load or stress.

3) Concrete possesses high compressive strength but is week in _____.

4) When the main reinforcement is in one direction it is a _____slab.

5) Gypsum is added to the cement for controlling_____.

6) In a singly reinforced beams, steel reinforcement is provided in _____.

7) Shear reinforcement is provided in the from of _____.

8) The neutral axis of a balanced section is called_____.

Q.12 Define the following terms.

1) Durability
2) Modular ratio
3) Effective length
4) Reinforced Cement Concrete
5) Column
6) Bond stress
7) Concrete
8) Over reinforced section

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Tech. (Agril. Engg.)

Semester	: VI (New)	**Term**	: II	**Academic Year**	: 2014-15
Course No.	: FMP 3610	**Title**	: Machine Design		
Credits	: 3 (2+1)				
Day & Date	: Wednesday, 13.05.2015	**Time**	: 09.00 to 12.00	**Total Marks**	: 80

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 a) Explain in detail general considerations in machine design.

b) Explain any eight mechanical properties of metals.

Q.2 a) A hydraulic press exerts a total load of 3.5 MN. This load is carried by two steel rods, supporting the upper head of the press. If the safe stress is 85 MPa and E=210 kN/mm^2, find : 1) diameter of the rods, and 2) extension in each rod in a length of 2.5 m.

b) Explain in detail shear stress and shear strain.

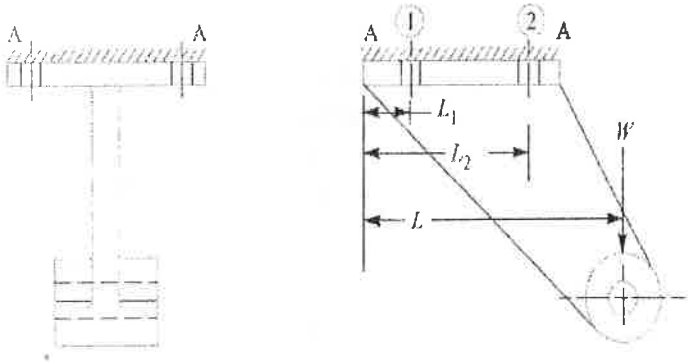
Q.3 Explain various methods of failure of Knuckle joint.

Q.4 a) Design a knuckle joint for a tie rod of a circular section to sustain a maximum pull of 70 kN. The ultimate strength of the material of the rod against tearing is 420 MPa. The ultimate tensile and shearing strength of the pin material are 510 MPa and 396 MPa respectively. Determine the tie rod section and pin section. Take factor of safety = 6.

b) Give advantages and disadvantages of welded joints over riveted joints.

Q.5 a) A plate 100 mm wide and 12.5 mm thick is to be welded to another plate by means of parallel fillet welds. The plates are subjected to a load of 50 kN. Find the length of the weld so that the maximum stress does not exceed 56 MPa.
Consider the joint first under static loading and then under fatigue loading.

b) A bracket, as shown in Fig. supports a load of 30 kN. Determine the size of bolts, if the maximum allowable tensile stress in the bolt material is 60 MPa.
The distances are: L1 = 80 mm, L2 = 250 mm, and L = 500 mm.



Q.6 a) Describe in detail important terms used in screw threads.

b) A pair of wheels of a railway wagon carries a load of 50 kN on each axle box, acting at a distance of 100 mm outside the wheel base. The gauge of the rails is 1.4 m. Find the diameter of the axle between the wheels, if the stress is not to exceed 100 MPa.

Q.7 a) A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10 000 N-m. The shaft is made of 45 C 8 steel having ultimate tensil stress of 700 MPa and a ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of the shaft.

b) Design the rectangular key for a shaft of 50 mm diameter. The shearing and crushing stresses for the key material are 42 MPa and 70 MPa.

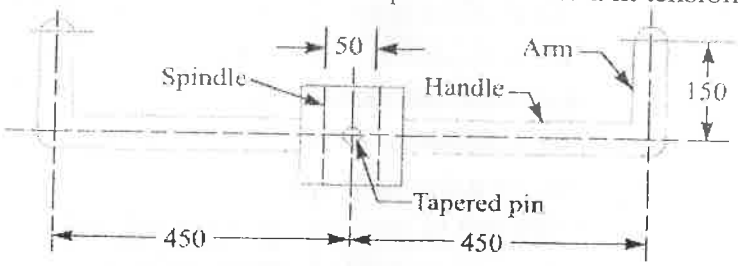
Q.8 a) Describe in detail about muff coupling.

b) Write in detail about helical spring.

Q.9 a) An engine running at 150 r.p.m. drives a line shaft by means of a belt. The engine pulley is 750 mm diameter and the pulley on the line shaft is 450 mm. A 900 mm diameter pulley on the line shaft drives a 150 mm diameter pulley keyed to a dynamo shaft. Find the speed of dynamo shaft, when 1) There is no slip, and 2) There is a slip of 2% at each drive.

b) Write advantages and disadvantages of gear drives.

Q.10 a) A handle for turning the spindle of a large valve is shown in Fig. The length of the handle from the centre of the spindle is 450 mm. The handle is attached to the spindle by means of a round tapered pin. If an effort of 400 N is applied at the end of the handle, find: 1) mean diameter of the tapered pin, and 2) diameter of the handle. If the allowable stresses for the handle and pin are 100 MPa in tension and 55 MPa in shear.



All dimensions in mm.

b) Write a procedure for selection of ball and roller bearings.

SECTION "B"

Q.11 Fill in the blanks.

1) _____ type of design depends upon mathematical formulae of principle of mechanics.
2) The _____ metals are those which have a metal other than iron as their main constituent.
3) Vickers hardness test also called_____ test.
4) _____ states that when a material is loaded within elastic limit, the stress is directly proportional to strain.
5) The Poisson's ratio is denoted by_____.
6) In_____welding, the welding rods coated with solid material are used.
7) An electric-resistance welding is an example of _____welding.
8) A screw made by cutting a single helical groove on the cylinder is known as_____ screw.

Q.12 State True or False.

1) Flank is the surface joining the crest and root.
2) Crest is the bottom surface created by the two adjacent flanks of the thread.
3) The crank shaft is an example of machine shaft.
4) An axle is a stationary machine element and is used for the transmission of bending moment only.
5) A key attached to one member of a pair and which permits relative axial movement is known as Gib-head key.
6) Carriage spring is mostly used in automobiles.
7) The ratio of load lifted to the effort applied is called Electronic advantage.
8) In the second type of levers, the load is in between the fulcrum and effort.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: **VI (New)**	**Term**	: **II**	**Academic Year**	: **2014-15**
Course No.	: SWCE 366	**Title**	: **Watershed Planning and Management**		
Credits	: 3 (2+1)				
Day & Date	: Monday, 11.05.2015	**Time**	: 09.00 to 12.00	**Total Marks**	: **80**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Explain the benefits of Agro forestry.

Q.2 a) Explain different approaches needed for watershed planning.

b) Describe continuous contour trenches (CCT) and Staggered contour trenches (SCT) for in situ Rainwater Conservation.

Q.3 Define sedimentation. Explain different factors which affect the sediment yield.

Q.4 In a watershed, following data were obtained on the stream order, number of stream of different order and length of streams of different orders.

Stream order	Number of streams	Stream length (km)
1	128	75.6
2	42	45.2
3	16	35
4	5	16.8
5	1	5

a) Determine the bifurcation ratio of the watershed.

b) If the area of watershed is 74.2 km^2 then determine stream frequency, drainage density, length of overland flow and constant of channel maintenance.

Q.5 a) Write down the important rationale for people's participation for watershed development projects.

b) The following data were collected for a proposed tank, determine the yield of catchment.

Catchment area = 1200 ha

Average annual rainfall = 90 cm

Intensity of rainfall of duration 1 hr and frequency 35 year = 5 cm/hr

Average runoff coefficient for the whole catchment = 20 %

Q.6 Explain causes of watershed deterioration.

(P.T.O.)

Q.7 Explain the term delineation of watershed. Write down the procedure to determine priority of watershed.

Q.8 State and explain different types of monitoring for watershed project.

Q.9 a) Enlist the different factors affecting watershed management.

b) Explain the factors affecting people's participation in watershed project.

Q.10 Describe the land use capability classification.

SECTION "B"

Q.11 Define the following terms.

1) Land capability classification
2) Relief ratio
3) Form factor
4) Evaluation
5) Saltation load
6) Compactness coefficient
7) Shape Index
8) Reforestation

Q.12 Fill in the blanks.

1) An elongated watershed has _____ bifurcation ratio than the normal/ circular watershed.
2) The inequilibrium stage is also called as _____, which reveals that watershed is under development process.
3) _____ is the product of relief and drainage density.
4) _____is the sum of saltation and surface creep.
5) _____ watershed has rich wildlife and plenty of vegetation.
6) Land capability Class VIII is used for _____.
7) _____ implies excavating trenches along the contour on the land.
8) Large watershed are dominated by _____flow.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: **VI (New)**	**Term**	: **II**	**Academic Year**	: **2014-15**
Course No.	: APE 368	**Title**	: **Refrigeration and Air Conditioning**		
Credits	: 2 (1+1)				
Day & Date	: Saturday, 09.05.2015	**Time**	: 09.00 to 11.00	**Total Marks**	: **40**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Prove that, COP of heat pump = 1+ COP of refrigerator, where COP is coefficient of performance.

Q.2 A refrigerator working on 1 k W compressor can cool down 10 litres of water from 30 ^{0}C to 10 ^{0}C in 4 min. Determine (a) Tonnage of refrigeration and (b) COP of system used.

Q.3 Discuss Reversed Carnot Cycle for working of air refrigerator.

Q.4 Enlist types of vapour compression cycles. Discuss theoretical vapour compression cycle with dry saturated vapour after compression.

Q.5 It is wished to freeze 10 tonnes of peas per day from an initial temperature of 15 ^{0}C to a final temperature -4 ^{0}C using stream of cold air. Estimate the maximum capacity of the refrigeration plant required, if it is assumed that the maximum rate of heat extraction from the product is twice the average rate. If the heat-transfer coefficient from the air to the evaporation coils, which form heat exchanger between the air and the boiling refrigerant is 22 J/m^2 s ^{o}C. Calculate surface area of evaporative coil required if the logarithmic mean temperature drop across the coil is 10 ^{0}C. The specific heat of peas is 3.98 kJ/kg ^{0}C above the freezing and 1.76 kJ/kg ^{0}C below the freezing, and the latent heat is 247 kJ/kg. The freezing point of peas is -1 ^{0}C.

Q.6 Enlist different types of refrigeration system? Discuss simple vapour absorption refrigeration system.

Q.7 A refrigeration machine using R-12 as refrigerant operates between the pressures 2.5 bar and 9 bar. The compression is isentropic and there is no undercooling in the condenser. The vapour is in dry saturated condition at the beginning of the compression. If actual coefficient of performance is 0.65 of the theoretical value, calculate tonnage of refrigeration. The refrigerant flow is 5 kg per minute. Properties of refrigerant are:

Pressure, bar	Saturation temperature ^{0}C	Enthalpy, kJ/kg		Entropy of saturated vapour, kJ/kg K
		Liquid	Vapour	
9.0	36	70.55	201.8	0.6836
2.5	-7	29.62	184.5	0.7001

Take C_p for superheated vapour at 9 bar as 0.64 kJ/kg K

(P.T.O.)

Q.8 Enlist different factors affecting human comfort. Discuss different factors. affecting optimum effective temperature.

Q.9 a) Classify Air conditioning systems.

b) A small office hall of 25 person capacity is provided with summer air conditioning system with the following data.

Outside conditions	= 34 ^{0}C DBT & 28 ^{0}C WBT
Inside conditions	= 24 ^{0}C DBT & 50% RH
Volume of air supplied	= 0.4 m^3/min per person
Sensible heat load	= 125 600 kJ/h

Find sensible heat factor (SHF) of the plant. Use psychrometric chart.

Q.10 For sample of air having 22 ^{0}C DBT, relative humidity 30 per cent at barometric pressure of 760 mm of Hg, Calculate.

1) Vapour pressure 2) Humidity ratio

3) Vapour density and 4) Enthalpy

SECTION "B"

Q.11 Define the following terms.

1) Sensible Heat factor
2) Azeotrope refrigerant
3) By-pass factor
4) Eutectic temperature

Q.12 Do as directed.

1) Assign number to refrigerant *monochlorodifluromethane.*
2) State Clausius statement.
3) State name of cycle for working of heat engine.
4) State why wetted clothe is put at the point of leak of ammonia in refrigeration system?

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: VI (New)	**Term**	: II	**Academic Year**	: 2014-15
Course No.	: IDE 365	**Title**	: Advanced Irrigation System Design		
Credits	: 2 (1+1)				
Day & Date	: Tuesday, 12.05.2015	**Time**	: 09.00 to 11.00	**Total Marks**	: 40

Note : 1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 a) What are the causes of clogging of emitters and laterals in drip irrigation?
b) Enlist different types of sprinkler irrigation system. Discuss the adaptability of sprinkler irrigation system.

Q.2 a) Give the functions of non-return valve and vacuum release valve in micro irrigation system.
b) Determine the theoretical discharge of sprinkler nozzle of size 3.0 x 2.5 mm at an operating pressure of 2.0 kg/cm^2.

Q.3 What are the different formulae used in the hydraulic design of sprinkler irrigation system?

Q.4 Calculate the quantity of water required in m^3 per hectare per day for banana using following data.

Spacing	: 1.5 x 1.5 m
Pan evaporation	: 10 mm/day
Pan factor	: 0.7
Wetted area	: 60 per cent
Crop factor	: 1.0

Q.5 a) Determine the required capacity of a sprinkler system to apply water at the rate of 1.25 cm/hr. Two 186 meters long sprinkler lines are required. Sixteen sprinklers are spaced at 12 m interval on each line. The spacing between lines is 18 meters.
b) Give the merits and demerits of micro irrigation system.

Q.6 a) Write in brief about raingun irrigation system.
b) What are the basic requirements of emitters?

Q.7 Enlist commonly used fertilizer equipments and discuss the working of ventury.

Q.8 Write down in detail about pressure-discharge relationship in drip irrigation.

(P.T.O.)

Q.9 Enlist different types of filters commonly used in drip irrigation system. Explain sand filter in detail with neat sketch.

Q.10 Write short notes on.

1) General maintenance of sprinkler irrigation.
2) Moisture distribution pattern under sprinkler irrigation.

SECTION "B"

Q.11 Fill in the blanks.

1) Hydrocyclone filters are also known as _____.
2) A uniformity coefficient of _____ is considered to be satisfactory in sprinkler system.
3) _____ valves are generally used to control pressures in sprinkler lateral lines.
4) The diameter of lateral is usually selected such that the difference in the discharge between two extreme emitters operating simultaneously should not exceed_____%

Q.12 State True or False.

1) Sprinkler irrigation system is most suitable for rice and jute crop.
2) Application efficiency in drip irrigation is the ratio of water required in the root zone to the total amount of water applied.
3) The commonly used acid for reducing or eliminating clogging hazard is Hydrochloric/ Sulphuric acid.
4) If the value of index for jet break up i.e. P_d is 4 then condition of drop size is good.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: **VI (New)**	**Term**	: **II**	**Academic Year**	: **2014-15**
Course No.	: AG 366	**Title**	: **Entrepreneurship Development and Communication Skills**		
Credits	: 2 (1+1)				
Day & Date	: Thursday, 14.05.2015	**Time**	: 09.00 to 11.00	**Total Marks**	: **40**

Note : 1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 What is Agri-entrepreneurship? Explain in detail the concept, need and scope of Agri-entrepreneurship.

Q.2 Explain in detail the government schemes and incentives for promotion of entrepreneurship.

Q.3 Describe in detail about formulation of project.

Q.4 What is an enquiry letter? Enumerate the points to be noted while drafting enquiry letter.

Q.5 Describe in detail the role of entrepreneurship in economic development of country.

Q.6 Describe in detail the communication process.

Q.7 What do you mean by SWOT Analysis?

Q.8 Explain in detail the different phases of Entrepreneurship Development Programmes.

Q.9 What is advertisement? Enlist types of advertisements and explain any one of them.

Q.10 Define market survey. Write down the steps in conducting market survey.

SECTION "B"

Q.11 State True or False.

1) Advertising is a mass and paid communication of goods, services or ideas by an identified sponsor.
2) In survey technique, data is collected by interviewing a limited number of people selected from a large group.
3) The entrepreneurs emerging from within the confines of organization are called Intrapreneurs.
4) State Bank of India launched EDPs in the year 1978.

Q.12 Give full form of the following.

1) EDP
2) MSEs
3) PMEGP
4) SSI

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Tech. (Agril. Engg.)

Semester	: **IV (New)**	**Term**	: **II**	**Academic Year**	: **2014-15**
Course No.	: EOES 244	**Title**	: **Electrical Machines and Power Utilization**		
Credits	: 3 (2+1)				
Day & Date	: Friday, 08.05.2015	**Time**	: 14.00 to 17.00	**Total Marks**	: **80**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Discuss about losses in a transformer. Derive the condition for maximum efficiency of transformer.

Q.2 The magnetic circuit of an iron ring has a cross section of 3 cm^2 and a mean circumference of 25 cm. An air gap of 0.4 mm has been cut across the section of the ring. The ring is wound with a coil of 200 turns through which a current of 3 A is passed. If the total magnetic flux is 0.24 mWb, find the relative permeability of iron, assuming no magnetic leakage. Also give explanation about different types of magnetic circuit.

Q.3 Give detailed classification and explanation of d. c. generators along with suitable diagrams.

Q.4 Derive the emf equation for d.c. generator and find the armature current, the induced emf and the flux per pole for an 8 pole, d. c. shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies a load of 12.5 Ω resistance at terminal voltage of 300V. The armature resistance is 0.24 Ω and the field resistance is 250 Ω.

Q.5 a) A 4 pole, d. c. motor takes an armature current of 150A at 440V. If its armature circuit has a resistance of 0.15 Ω, what will be the value of back emf at this load? What do you understand by the term 'back emf'?

b) In the case of 8-pole induction motor, the supply frequency was 50Hz and the shaft speed was 735 rpm. What were the magnitudes of the following?

i) synchronous speed ii) speed of slip
iii) per unit slip iv) percentage slip

Q.6 Give detailed construction of induction motor. Also state advantages and disadvantages of induction motor.

Q.7 What is the importance of starter in induction motor? Explain different types of starters for induction motor.

Q.8 Why single phase induction motors are not self starting? How to make single-phase induction motor self-starting?

Q.9 Why speed control is essential? Explain different methods for d. c. shunt motor speed control.

Q.10 Explain the armature reaction for d. c. generator. How its effects can be minimized?

(P.T.O.)

SECTION "B"

Q.11 Choose correct alternative.

1) The unit of magnetic flux is _____.

a) Weber
b) Ampere turn
c) Tesla
d) Coulomb

2) Relative permeability of vaccum is _____.

a) zero
b) one
c) two
d) three

3) Hysteresis loss in a magnetic circuit is due to its _____.

a) retentivity
b) coercivity
c) flux density
d) both (a) and (b)

4) The steel used for transformer cores has _____.

a) high silicon content
b) high permeability
c) low hysteresis loss
d) all of these

5) Short circuit test of a transformer helps us to find its _____.

a) iron loss
b) full load copper loss
c) copper loss at no load
d) copper loss at any desired load

6) The unit of magnetizing force is _____.

a) Henry/ meter
b) Weber / meter^2
c) Ampere/ meter
d) Joule / Weber

7) A transformer having 1000 primary turns is connected to a 250 V a.c. supply. for a secondary voltage of 400 V, the number of secondary turns should be _____.

a) 1600
b) 250
c) 400
d) 1250

8) Permanent magnets are normally made of _____.

a) aluminum
b) wrought iron
c) cast iron
d) alnico alloys

Q.12 Give functions of following parts of dc machines.

1) Yoke
2) Brushes
3) Armature core
4) Armature winding
5) Pole shoes
6) Pole coil
7) Commutator
8) Pole core

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