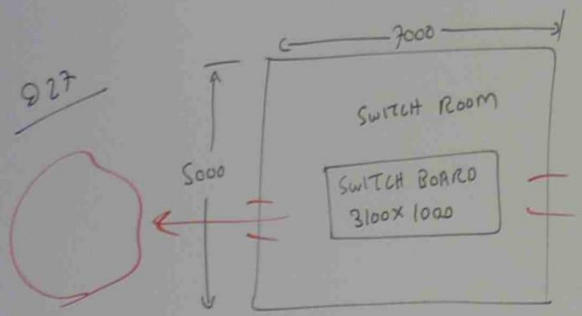
Q25. NAME TWO MATERIALS SUITABLE FOR THE CONSTRUCTION OF SWITCH BOARD SURROUNDS. METAL | CONCRETE

Q26 THE MAXIMUM NUMBER OF SWITCHES CLASSED AS MAIN SWITCH IN ANY ONE INSTALLATION IS 6

Q27



THE GLUGN DIAGRAM REPRESENTS A SWITCH BOARD LOCATED IN A SWITCH ROOM. REFER AS 3000 AND ANSWER THE FOLLOWING QUESTIONS

(a) HOW MANY EXITS ARE REQUIRED? SUFFICIENT

(b) WHICH DIRECTION WILL THE EXIT DOOR SWING

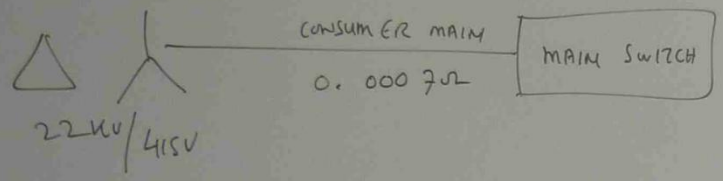
(C) WHAT IDENTIFICATION MUST BE PLACED ON THE EXIT DOORS? SWITCH BOARD

Q28 WHAT IS THE SIZE OF EXIT DOOR? 0.75m x 0.43m

Q29 CALCULATE THE FAULT CURRENT AT A MAIN SWITCH BOARD THAT IS BEING SUPPLIED BY A 500 KVA $\Delta\lambda$ 22kV/415V TRANSFORMER WITH A PHASE IMPEDANCE 0.02Ω WHICH IS CONNECTED THROUGH A CONSUMER MAIN WITH IMPEDANCE 0.0007Ω.

Q 27(b) Door of Switch Room (or) other rooms dedicated to Switch Board shall open in the direction of egress without the use on the switch board side of the door of a key tool.

Q29



$$I_{fL} = \frac{KVA \times 10^3}{\sqrt{3}\, E} = \frac{500 \times 10^3}{1.7321 \times 415} = 695 \text{ Amp.}$$

$$\%X = \frac{I_{fL} \times X_{ph}}{E_{ph}} \times 100$$

$$= \frac{695 \times (0.0207)}{\left(\frac{415}{\sqrt{3}}\right)} \times 100$$

$$= 5.99\ \%$$

$$I_{Sh} = \frac{I_{fL}}{\%X} \times 100$$

$$= \frac{695}{5.99} \times 100$$

$$= 11602 \text{ Amp.}$$

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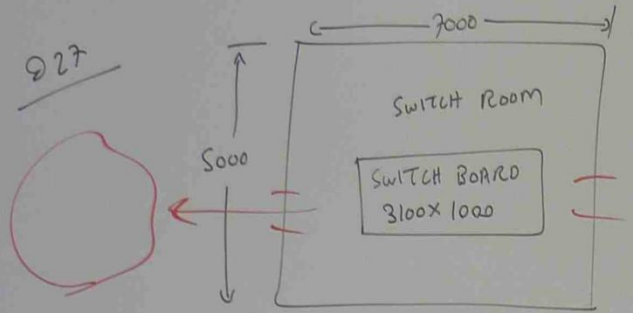

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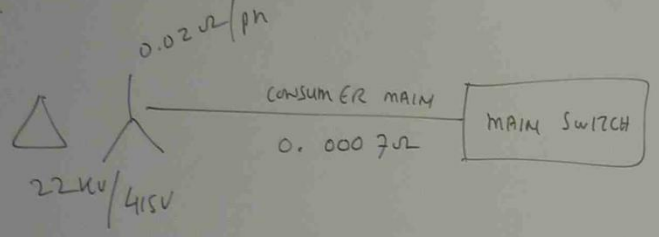
Q 27 (b) DOOR of SWITCH ROOM (OR) OTHER ROOMS DEDICATED TO SWITCH BOARD SHALL OPEN IN THE DIRECTION OF EGRESS WITHOUT THE USE ON THE SWITCH BOARD SIDE OF THE DOOR OF A KEY TOOL.

Q29



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Q 30 AREAS WHERE COMBUSTIBLE DUSTS CREATE THE HAZARD ARE CLASSIFIED AS CLASS II

Q 31 AREAS WHERE FLAMMABLE GASES ARE LIKELY TO OCCUR IN NORMAL OPERATION ARE CLASSIFIED AS CLASS 1 ZONE (1)

Q32 AREAS WHERE EXPLOSIVE GASES ARE CONSTANTLY PRESENT ARE CLASSIFIED AS _____. CLASS 1 ZONE (0)

Q33 EQUIPMENT MUST BE INSTALLED IN A CLASS 1 ZONE 0 HAZARDOUS AREA IN ACCORDANCE WITH AS 2381.1

Q34 THE WIRING SYSTEM USED EXTENSIVELY FOR CONTROL FUNCTIONS IN CLASS 1 ZONE 0 IS CLASSIFIED AS Ex ia

Q35 CABLE GLAND FOR EQUIPMENTS IN CLASS II HAZARDOUS AREA SHOULD HAVE THE RATING IP

Q36 IS EQUIPMENT WITH A LIQUID DIELECTRIC HAVING A FLASH POINT LESS THAN 250°C PERMITTED IN HAZARDOUS AREA? NO.

Q37

3 WIRING METHODS THAT MAY BE USED IN CLASS 1

ZONE 1 AREA ARE

MIMS

TPS IN CONDUIT

TPS

Q38. WHAT IS THE PURPOSE OF FLAME PATH IN EQUIPMENT LABELLED Exd

ALLOW INTERNAL EXPLOSION PRESSURE WITHOUT IGNITING EXTERNAL GASES.

Q39

DESCRIPTION OF AREA	CLASS DESCRIPTION
WHEAT HANDLING	C II
FUME EXTRACTION IN A FURNITURE VARNISHING AREA	C I
WOOD AND DUST EXTRACTION SYSTEM	C II
UNDERGROUND PIT IN SERVICE STATION	C I
METHYLATED SPIRIT BOTTLING PLANT	C I
INSIDE PETROL STATION	C I
CARBON BLACK PROCESS AREA	C II
INSIDE SEWERAGE TREATMENT PLANT	C I
INSIDE PETROL STORAGE TANK	C I
U.G CAR PARK	C I

(40) THREE WIRING METHODS THAT MAY BE USED IN CLASS 1, ZONE 1 AREA ARE

MIMS TPS TP1 IN CONDUIT

(41) WHAT IS THE PURPOSE OF THE FLAME PATH IN EQUIPMENTS LABELLED Exd?

(42) ARE WIRING SYSTEM SUITABLE FOR CLASS 1 ZONE II ALWAYS SUITABLE FOR USE IN CLASS 1 ZONE 1 AREA?

(43) NAME THREE TYPES OF EQUIPMENT THAT AS 3000 SPECIALLY EXCLUDES FROM USE IN HAZARDOUS LOCATIONS.

(44) BRIEFLY DESCRIBE THE DIFFERENCE BETWEEN A MIMS STANDARD GLAND PATTERN AND A FLAME PROOF (OR) Exd PATTERN

(45) ARE WIRING SYSTEMS FOR CLASS 1 AREAS ACCEPTABLE AS WIRING SYSTEMS IN CLASS II AREA?

(46) NAME TWO WIRING SYSTEMS SPECIALLY EXCLUDED BY AS 3000 FOR USE IN CLASS II AREA.

(47) WHICH TYPE OF LIGHT FITTING MAY BE INSTALLED IN (OR) ABOVE A CLASS 1 ZONE 1 AREA?

(48) WHICH ELECTRICAL SYSTEM IS PERMITTED FOR USE IN ALL HAZARDOUS LOCATIONS?

(49) DOES A CONDUIT (OR) PIPE CARRYING THE SUPPLY CABLE FROM THE OPERATOR'S CONSOLE TO THE PETROL PUMP IN SERVICE STATION NEEDED TO BE SEALED WHERE IT ENTERS THE CONSOLE AREA?

41 Exd

ALLOW INTERNAL EXPLOSION PRESSURE WITHOUT IGNITING EXTERNAL GASES

42 NO

43 BATTERY CHARGER
SODIUM VAPOUR LAMP
DIELECTRIC WITH FLASH POINT LESS THAN 250 C

44 Exd LARGER THREAD LENGTH

45 NOT ALWAYS

46 BARE CONDUCTOR, OPEN WIRING

47 TOTALLY ENCLOSED, FITTED WITH GLAND
NO LOW PRESSURE SODIUM LAMP

48 INTRISIC SAFETY
SPECIAL PRECAUTION

49 NO.

- OVER CURRENT PROTECTION, OVER LOAD & SHORT CIRCUIT
  (AS 3000:2007 CLAUSE 2.5.3 & 2.5.4)

- PROTECTION AGAINST SWITCH BOARD ARCING FAULTS BY INTERNAL SEPARATION (OR) LIMITATION BY PROTECTIVE DEVICES
  (CLAUSE 2.5.5)

- RELIABILITY of SUPPLY, CO-ORDINATION & DISCRIMINATION
  (CLAUSE 2.5.7)

OVER CURRENT PROTECTION (1.5.9)
- AUTOMATIC DISCONNECTION
- LIMITING MAXIMUM OVER CURRENT TO SAFE VALUE & DURATION

2.5.5 SWITCH BOARD INTERNAL ARCING FAULT PROTECTION

- SAFE OPERATION, INSPECTION, TESTING, MAINTENANCE
- DO NOT CAUSE DANGER FROM ELECTRIC SHOCK

SAFE WORKING DISTANCE FOR L.V = 500mm FROM LIVE PART

2.5.7 RELIABILITY OF SUPPLY

1.6.1 (b) FUNCTION CORRECTLY AS INTENDED

(c) CONNECT, OPERATE SAFELY, BE COMPATIBLE WITH ELECTRICITY DISTRIBUTION SYSTEM

(d) MINIMISE INCONVENIENCE IN CASE OF A FAULT

PROTECTION AGAINST OVER CURRENT

- SUPPLY INFORMATION
- PROSPECTIVE (OR) DEEMED SHORT CIRCUIT CURRENT AT THE POINT OF SUPPLY
- 1.6.2 (1) PROSPECTIVE SHORT CIRCUIT CURRENT
  - SERVICE RULE
  - ARCING FAULT LEVEL 60% AND 30%

1.4.38 OVER LOAD CURRENT

- TEMPORARY
- PERMANENT

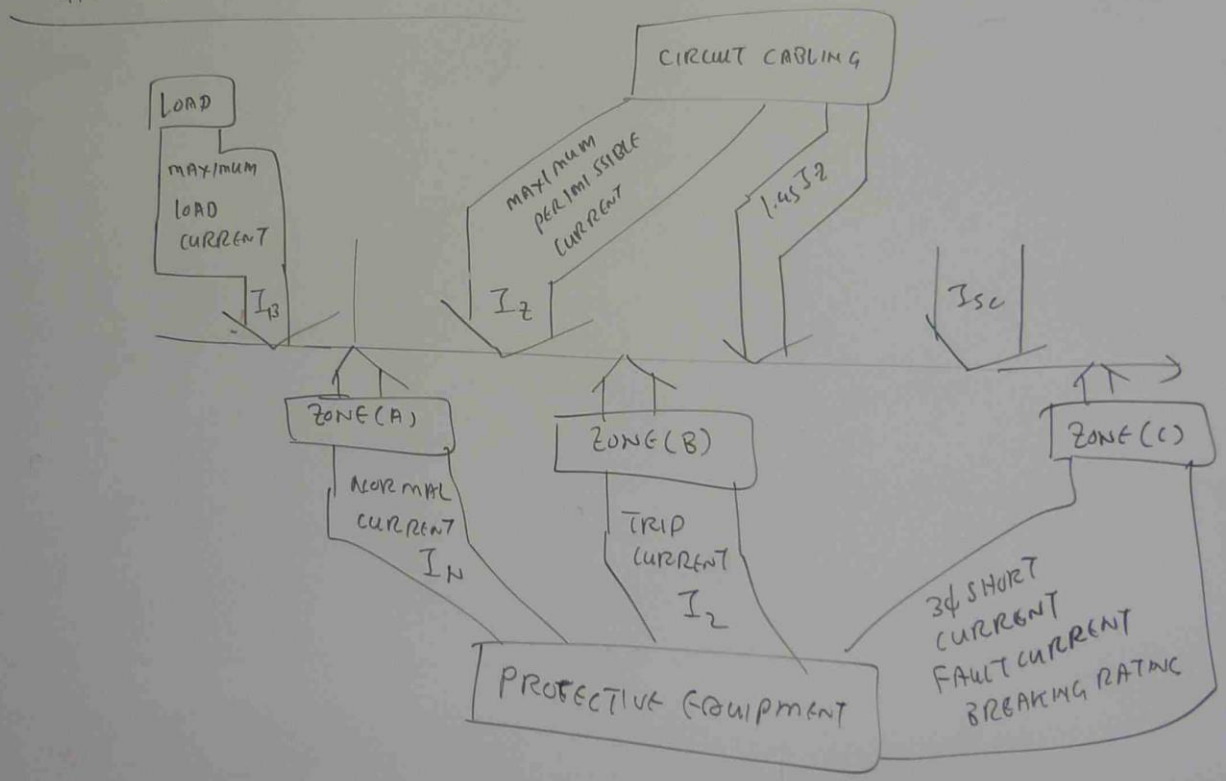
1.4.39 SHORT CIRCUIT CURRENT

FAULT CURRENT RESULTING FROM A FAULT OF NEGLIGIBLE IMPEDANCE BETWEEN LIVE CONDUCTORS HAVING A DIFFERENCE OF POTENTIAL UNDER NORMAL OPERATION CONDITION.

3.5.2 NEUTRAL CONDUCTOR SIZE = NOT LESS THAN THE SIZE OF LARGEST ACTIVE CONDUCTOR

5.3.3.1.2 EARTH CONDUCTOR = NOT LESS THAN 25% OF THE SIZE OF ACTIVE CONDUCTOR

CABLE PROTECTION REQUIREMENT



ZONE (A)

ZONE (B)

ZONE (C)

ZONE (A) $I_B \leq I_N \leq I_Z$ ← 2 5.3.1 , EQUATION 2.1 OVER LOAD

ZONE (B) $I_2 \leq 1.45 I_Z$ ← 2.5.3.1 , EQUATION 2.2 OVER LOAD

ZONE (C) $I^2t = K^2S^2$ ← 2.5.4-5 EQUATION 2.4 SHORT CIRCUIT

S = C.SA mm^2

I = CURRENT

t = TIME

k = CONTANT